

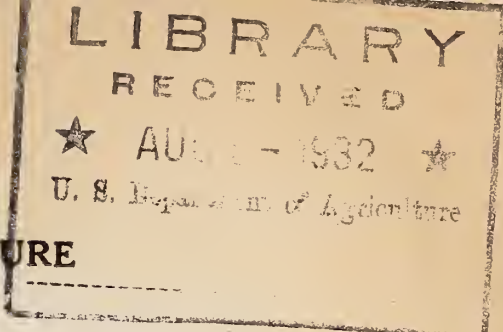
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UNITED STATES DEPARTMENT OF AGRICULTURE  
Bureau of Agricultural Economics

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Agricultural Economics Bibliography No. 35

SWITZERLAND

A GUIDE TO OFFICIAL STATISTICS ON AGRICULTURE  
POPULATION AND FOOD SUPPLY

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PART I. - AN ANNOTATED LIST OF OFFICIAL PUBLICATIONS

Compiled by A. M. Hannay  
Under the Direction of Mary G. Lacy, Librarian  
Bureau of Agricultural Economics

PART II. - METHODS OF COLLECTION AND ANALYSIS OF OFFICIAL STATISTICS

By J. D. Black and Fritz Bachman  
For the Bureau of International Research  
of Harvard University and Radcliffe College

Washington, D. C.  
March, 1932.

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## FOREWORD

The Library of the Bureau of Agricultural Economics has had a constant demand for the agricultural statistics of foreign countries. In order to supply a guide to these statistics the library undertook to index the sources of official foreign statistics. After several years' work it was decided to publish a guide for one country at a time rather than for a group of countries as had been planned.

At about this time Dr. J. D. Black of Harvard University had become interested in a somewhat similar project. In 1929 at the suggestion of Dr. Edward M. East of the Bussey Institution of Harvard University, the Bureau of International Research of Harvard University and Radcliffe College made a grant to Dr. Black to enable him to conduct a comparative study of the statistics of agriculture, population and food supply of different countries. The aim of the study was to promote a more effective use of the statistics now available, and to lay the foundation for methods of collecting future statistics that would lend themselves better to international comparisons. A plan for combining the two undertakings and publishing the results in the Agricultural Economics Bibliography series of the Library of the Bureau of Agricultural Economics was approved by the two agencies. Switzerland was chosen as the first country because of the excellence of its statistics and because Dr. Fritz Bachman of Switzerland was at Harvard University ready to help with the part of the work to be done by the Bureau of International Research of that University.

### PART I

In Part I which was compiled by Mrs. A. M. Hannay of the Library, Bureau of Agricultural Economics, the official publications of Switzerland containing agricultural statistics which are in the library of the Department of Agriculture and in the Library of Congress have been listed and their contents noted. Entries have been made according to the form used in the library of the U. S. Department of Agriculture, except for publications found only in the Library of Congress. In such cases the Library of Congress form was used. In cases where the Library of Congress form differs from that of the U. S. Department of Agriculture the Library of Congress form was also indicated. This difference is due primarily to the fact that the Library of Congress catalogues the publications of the Statistical Bureau, for example, directly under the Bureau, while the Library of the Department of Agriculture catalogues them under the Ministry to which the Bureau is attached. Cross references have been used to minimize any difficulty resulting therefrom.

Following the practice in the two libraries a date followed by a dash indicates that from that date the library has been receiving the publication and was still continuing to receive it at the time the file was examined.



The call numbers used in the two libraries have been given in the left-hand margin. They are preceded by the initials U.S.D.A. for the United States Department of Agriculture, and L.C. for the Library of Congress.

The Rapport sur le Commerce et l'Industrie de la Suisse has been included though it is a secondary source. The statistics it contains are for the most part based on official figures.

Statistics of the separate cantons have not been included in Part I, except when they were found in publications of the Confederation.

## PART II

In Part II the official agricultural statistics of Switzerland have been compared with those of the United States. The principal method of testing comparability has been to tabulate the statistics of Switzerland and the United States in parallel columns and to work out various significant ratios from them, such as that between population and agricultural land. These have been used as a basis for estimating the possible effects of differences in methods of collecting and analyzing the statistics, and for suggesting possible methods of reducing the existing data to a comparable basis and of collecting future statistics that will be comparable. In similar studies of other countries it is planned to make comparisons with the statistics of the United States, Switzerland and still other countries. In each case, the results will be related to the methods employed by the country in collecting the data for the 1930 World Census of Agriculture.

Part II also contains a supplementary bibliography at the beginning of each section giving references to official sources of general population statistics; references to important secondary sources of information, statistical or otherwise; and references to discussions of methods of collecting and analyzing statistics.

This first study has required a great deal of preliminary work that will not need to be repeated for other countries.

In developing the procedure of Part II, the two authors have had the assistance of the members of the group of agricultural economists at Harvard University, more particularly of Mr. Henry I. Richards, Dr. Murray R. Benedict and Miss Martha Epps. Numerous revisions were made in the report after it was reviewed critically by Dr. André Borel and Dr. Oskar Howalt of the Secrétariat des Paysans Suisses, which is the official agency that collects a large part of the agricultural statistics of Switzerland.

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U.S.D.A. 17. Annuaire agricole de la Suisse, année 1- , 1900- , Berne, 1900-

An7 1. Année (1900) = 14.année de l'édition allemande.  
(Landwirtschaftliches Jahrbuch der Schweiz.)

L.C. S257 1900-1914, publié par le Département Fédéral de l'Agriculture.

.A35 1915-1919, publié par le Département Suisse de l'Économie Publique.

1920- , publié par le Département Fédéral de l'Économie Publique.

At head of title, 1900-1914: Annexe au "Bulletin du Département Fédéral de l'Agriculture"; 1915-1919: Annexe au Bulletin de l'Office Vétérinaire et de la Division de l'Agriculture du Département Suisse de l'Économie Publique; 1920- : Annexe au Bulletin de l'Office Vétérinaire et de la Division de l'Agriculture du Département Fédéral de l'Économie Publique.

U.S.D.A. has 1900- (lacks, 1912, no. 3 - 1913, no.1; 1926, no. 4 - 5; 1930, no. 3).

L.C. has 1901-

Contains original and scientific articles on various phases of agriculture and livestock raising.

Annual report of the Swiss Federation of Syndicates for Raising Red Spotted Cattle.

Annual statistics of working expenses (cost of production, current expenses for upkeep of household, wages, seed, fertilizer, taxes, etc.) and of gross and net returns of farms of various sizes. Movement of prices and index numbers. In 1921 and following years the statistics are published in extended form and in 2 parts. Vol. for 1921 contains figures for 1918/19 and 1919/20 (Mar. 1, 1918 - Feb. 29, 1920). It contains also a specially detailed account of the influence of the methods of utilization of the soil and of the type of enterprise on the results obtained which forms "a veritable history of [Swiss] agriculture during the war period." These statistics are also

issued in separate form. For detailed analysis, See under Union Suisse des Paysans. Recherches Relatives à la Rentabilité de l'Agriculture.

Federal subventions to agriculture.

Vol. for 1916 contains an extract from a study by Dr. A. Schmid in which total subsidies to agriculture for years 1885, 1901, 1910, 1914 are given and a summary of the author's study of their distribution and of his conclusions with regard to their influence on the development of agriculture. For complete article see Landwirtschaftliches Jahrbuch der Schweiz (Jahrg. 30, Hft. 3, 1916).

Statistics of milk and milk products.

Vol. for 1918 contains a study of milk production and utilization covering the years 1911 to 1918, with provisional figures for 1918.

Annual statistics of production (cow's milk, goat's milk); consumption (total, per capita); transformation into by-products, 1911-1917; provisional figures, 1918.

Production of cheese; quantity available for consumption (total, per capita); excess of export over import; production of butter; quantity available for consumption; excess of import over export; production, export of condensed milk, 1911-1917; preliminary figures for 1918.

Tables are given for each canton and for Switzerland as a whole, covering 1917, and showing the population, the number of cows, the daily average consumption of milk per capita, the total daily consumption and for each month the daily production per cow, the total daily production, and the quantity of milk used for livestock raising.

Annual report of milk statistics, issued by the Swiss Milk Commission, 1922-date (vol. for 1923-date)

Numbers of cows, goats; annual production of milk per cow, per goat; total production of milk, 1916-

Average monthly temperature and rainfall, 1922-

Condition of fodder in meadows and pastures, 1920-

Importation of fodder, by varieties, 1920-

Average prices of hay and oil cakes, 1920/21-

Monthly deliveries of milk to factories or distributing centers, 1924- (vol. for 1926- )

Utilization of milk: annual production; milk used for feeding stock; in household of producer; for sale to consumers; for production of butter, cheese, condensed milk, etc.; production of cheese; butter; condensed milk, 1920-

Consumption of milk in cities, total, daily per capita, 1921-

Production, import, export, consumption of cheese, butter, 1920-

Import and export of milk and milk products (quantity, value), fresh milk, condensed and sterilized milk, fresh



butter, cream, melted butter, soft and hard cheeses; export of powdered milk, chocolate, 1920-

Prices: A. Milk:

1. For consumption, per 100 kg., by cantons. Summer, 1920; winter, 1920/21; summer, 1921; Nov./Jan., 1921/22; Feb./Mar., 1922; April, 1922; May/July, 1922; Aug./Oct., 1922; Nov./Dec., 1922 (Vol. for 1923); Nov./Jan., 1921/22; Feb./Mar., 1922; Apr., 1922; May/July, 1922; Aug./Oct., 1922; Nov./Dec., 1922; Jan./Apr., 1923; May/Oct., 1923; Nov./Apr., 1923/24 (Vol. for 1924); May/July, 1922; Aug./Oct., 1922; Nov./Dec., 1922; Jan./Apr., 1923; May/Oct., 1923; Nov./Apr., 1923/24; May/July, 1924; Aug./Oct., 1924; Nov./Apr., 1924/25 (Vol. for 1925); various combinations of months - date

2. For cheese production, as above, summer, 1920-date.

3. For butter production, as above, summer, 1920-date.

Quarterly retail prices of milk, 1920- . Monthly retail prices of milk in 8 large cities; average retail price in 33 cities, 1923- (Vol. for 1924- )

B. Cheese:

Prices paid to producer, winter cheese, 1921/22- ; summer cheese, 1922- ; average monthly retail price in 33 localities, 1921- ; retail price in various markets. (Dec., Mar., June, Sept.) 1921- ; fixed export price, 1926- (Vol. for 1928- )

C. Butter:

Wholesale and retail prices, 1921- ; monthly, 1923- (Vol. for 1924- ); monthly prices quoted on various markets, 1922-

Comparative retail prices in principal Swiss cities, bread, beef, lard, milk, butter, cheese, potatoes, 1915- (Vol. for 1926- ).

U.S.D.A. Landwirtschaftliches Jahrbuch der Schweiz. Jahrg. 1- , 1887- ,  
17 Bern, 1887-

L23 For French edition see Annuaire Agricole de la Suisse,  
1900-

L.C. Jahrg. 1-28, 1887-1914, hrsg. vom Schweizerischen  
S7 Landwirtschaftsdepartement.

.L46 Jahrg. 29-33, 1915-1919, hrsg. vom Schweizerischen  
Volkswirtschaftsdepartement.

Jahrg. 34- , 1920- , hrsg. vom Eidgenössischen  
Volkswirtschaftsdepartement.

At head of title, 1900-1914: Beilage zu den "Mitteilungen des schweizerischen Landwirtschafts-Departements"; 1915-1919: Beilage zu den "Mitteilungen des Veterinärarantes und der Abteilung für Landwirtschaft des schweizerischen Volkswirtschaftsdepartements"; 1920- : Beilage zu den

"Mitteilungen des Veterinär-amtes und der Abteilung für Landwirtschaft des Eidgenössischen Volkswirtschafts-departements."

V. 20, hft. 11 contains index to Vols. 1887-1906.

U.S.D.A. has 1887- (lacks v. 24, hft. 7)

L.C. has 1887-1902; 1910-1911.

Contains original and scientific articles additional to or coinciding with those in the French edition.

Annual report of the Swiss Federation of Syndicates for Raising Red Spotted Cattle.

Annual farm management statistics. Also published in separate form. For detailed analysis, see under Union Suisse des Paysans. Recherches Relatives à la Rentabilité de l'Agriculture.

Federal subventions to agriculture. Article by Dr. A. Schmid in v. 30, no. 3, 1916. Total subsidies given for 1885, 1901, 1910, 1914.

Statistics of milk and milk products. Figures covering 1911-1917 in vol. for 1918; annual statistics, 1922- (Vol. for 1923- ). For detailed analysis, see under Annuaire Agricole de la Suisse.

L.C. Schweizerisches handelsamtsblatt. Feuille officielle suisse  
HF223 du commerce. Foglio ufficiale svizzero di commercio.  
.A4 Statistics are mostly in the supplements which are catalogued separately.

L.C. Switzerland. Arbeitsamt. Sozialstatistische mitteilungen.  
HC395 Hrsg. vom eidgenössischen arbeitsamt. 1.-5. jahrg. 1923-  
.A45 1927... Informations de statistique sociale, publiées par l'Office fédéral du travail. 1.-5. année, 1923-1927. Bern, 1923-1927.  
Irregularly issued, 1923-1924. Monthly, 1925-1927. Year begins with February, 1925-1927.  
German and French. No. 12 of 5th year not published. United in January, 1928, with Wirtschaftsberichte des Schweizerischen Handelsamtsblattes to form Wirtschaftliche und Sozialstatistische Mitteilungen, and with Rapports Économiques de la Feuille Officielle Suisse du Commerce to form Rapports Économiques et Statistiques Sociales. (See p.36)  
1923. hft. 1. Haushaltungs-rechnungen schweizerischer familien aus dem jahre 1920. Comptes de ménage de familles suisses pour 1920.  
German. Title-page and table of contents in German and French.  
Numbers of families and individuals according to occupation and income; income of various family members; expenditure by categories (i.e. food, clothing, rent, etc.),



in Zurich, Bâle, Berne, towns of more than 10,000 inhabitants, other regions.

Expenditure for separate items of food, drink, tobacco; consumption of articles of food, by families, occupation, income, in Zurich, Bâle, Berne, towns of more than 10,000 inhabitants, other regions.

1923. Hft. 2. - Haushaltungs-rechnungen schweizerischer familien aus dem jahre 1921, verglichen mit solchen aus den jahren 1912, 1919 und 1920. 1923, Livr. 2. - Budgets de familles tenus en Suisse durant l'année 1921, comparés avec des budgets tenus en 1912, 1919 et 1920.

Two separate publications, in German and in French.

The statistics cover the same items for 1921 as those in the previous number for 1920. A general comparison is made with corresponding findings for 1919.

Feb.-Dec., 1925. - Average monthly prices (comparative figures for preceding month and for corresponding month of preceding year) of beef, veal, mutton, pork, lard, fat, horse meat, milk, bread, eggs, potatoes, butter, cheese, rice, corn flour, oat meal, oat flakes, sugar, honey, cocoa, chocolate, coffee, tea, beans, peas, lentils, dried apples, pears and plums, peanut oil, apples, pears, wood.

Monthly index numbers of prices of groups of necessary commodities, according to occupations (milk products; eggs; fats and oils; meat and meat products; bread and grain products; sugar and honey; potatoes and legumes; coffee; tea; cocoa; chocolate.

Monthly retail prices (comparative figures for preceding month and for corresponding month of preceding year) of beef, pork, veal, lard, fat, butter, cheese, milk, bread, white flour, sugar, potatoes, eggs in 33 communes (Feb., 1925 - Nov., 1927); 34 communes (Dec., 1927).

Monthly index numbers of cost of living.

L.C. Switzerland. Bureau des bauwesens.

HA1601 Bevölkerung und arealverhältnisse der Schweiz.

.A3 Zusammenstellung des eidgenössischen Bureau des bauwesens vom jahr 1877 nach nachstehend bezeichneten quellen. Population et rapports de la superficie du territoire suisse. Tableau du Bureau fédéral des travaux publics de l'année 1877 d'après les sources indiquées d'autre part.

Population by cantons on December 1, 1870.

Area of productive land (woods, vineyards; fields, gardens, meadows, pasture land, etc.;) and of non-productive land (lakes, rivers, etc.)

L.C. Switzerland. Departement des innern. Ergebnisse der volkszählung  
HA1608 vom 1. dezember 1880 im kanton Bern. Ersg. von der Direction  
.B4A6 des innern. Recensement de la population du 1er décembre  
1880 1880... Bern, Buchdr. G. Michel, 1881. 100p.

German and French.

Census of the population of Berne, December 1, 1880.



L.C. Switzerland. Departement des innern.  
HA1608 Hauptergebnisse der volkszählung vom 1. dezember 1870  
.B4A6 im Kanton Bern. Mit einem erläuternden vorworte. Hrsg.  
von der Direktion des innern. Bern, Gedruckt bei A. Fischer,  
1871. 57 p.  
Statistics of population of Canton of Berne on December  
1, 1870.

L.C. Switzerland. Departement des innern. Matériaux pour la statistique  
HA1593 de la Confédération suisse [Berne, 1854-58] 2v. Issued in  
.A3 five parts.

Published also in German with title: Beiträge zur  
Statistik der Schweizerischen Eidgenossenschaft.

L.C. has: t.2, t.3, t.5

[t.2]. Tableaux de la population et autres concernant  
la statistique de la Suisse, dressés par le Département  
fédéral de l'intérieur. 2. partie, Berne, 1854.

Contains some of the results of the census of the  
population taken in March, 1850. Tables are given showing  
the numbers of Swiss living in the United States in March,  
1850, and also the numbers of emigrants to the United States  
from July 1, 1851 to June 30, 1853.

[t.3]. Statistische übersichten über den boden der  
Schweiz, seine bebauungsarten und haupterzeugnisse,  
zusammengestellt vom eidgenössischen Departement des innern.  
3. teil, Bern, 1855.

Statistics of area, population, households, land owners,  
by cantons, according to the most recent land survey in  
each; area of arable land, pasture, meadows, vineyards,  
forests, and unproductive land (streams, roads, etc.).

Results of a federal inquiry made in 1842-43, by cantons:  
production, import, export, consumption of grain; production  
of potatoes and fruit; area in vines; production, yield,  
import, consumption (total and per capita) of wine; area in  
forests; production, yield, import (quantity, value), export  
(quantity, value) of timber.

Statistics of import and export (quantity), 1853 and  
average for 1852-54: grain, rice, barley, flour, noodles,  
butter, beer, chestnuts, chicory, brandy and alcohol, cheese,  
fresh fruit, dried fruit, hops, oils, wool, flax, hemp and  
tow, honey, eggs, hides, tobacco leaves, wine, wood and  
timber.

Highest and lowest half-yearly prices in new Swiss francs  
at 4 main markets 1845-1855.

Grain prices in Aargau in old Swiss francs at Martinmas,  
1838-1851: spelt, oats, wheat, rye, barley, beans, peas.

Average grain prices in Lausanne in new francs, 1842-  
1854, wheat, rye, maslin.



Numbers of horses, cattle, by cantons, 1842-43.

Numbers of cattle (cattle for breeding, oxen, cows, calves) by cantons. (dates vary with cantons)

Numbers of sheep, goats, hogs, by cantons.

Numbers of milk cows, production of cheese and butter (total and per cow), export of cheese and butter.

Statistics of import and export of livestock (asses, horses and foals, horned cattle, calves, sheep and lambs, goats and kids, hogs) 1853; average for 1852-54.

Numbers of livestock slaughtered, by the State and privately, in Zürich, 1842, 1843, 1852, 1853, oxen, cows, calves, hogs, sheep, goats.

Numbers of livestock slaughtered in Freiburg, 1836, 1837, 1851, 1852, oxen, cows, calves, hogs, sheep, goats.

Statistics of meat consumption in Basel (aver. 1833-38, 1849, 1850); Aargau (Report of Apr. 1, 1852); Thurgau (Report of Aug. 19, 1854); Lausanne (1848, 1850, 1851); Geneva (aver. 1838-42, 1849, 1851)

Price of meat in 21 cantons or towns during "half of the winter month" (in this case probably January), beef, veal, mutton.

t.5 Tableaux statistiques du commerce de la Suisse avec l'étranger et surtout avec les états voisins, (L'Union Douanière, l'Autriche, La Sardaigne et la France) avant et après la centralisation des péages fédéraux, par le Département Fédéral de l'Intérieur. Berne, 1858.

Annual statistics of import, by products, 1840-1849; import, export, and transit, 1852-1856.

Trade between Switzerland and Baden, Württemberg, Bavaria, and the Customs Union, 1840; trade between Switzerland and the Customs Union, 1851 (quantity, value).

Trade between Switzerland and Austria, 1844, 1855; between Switzerland and Sardinia, 1854, 1855; between Switzerland and France, 1842, 1852.

Switzerland. Departement des innern. See also Switzerland. Eidenössisches departement des innern, and Switzerland. Statistisches bureau.

U.S.D.A. Switzerland. Département suisse de l'économie publique. Das 262 Wirtschaftsjahr 1929. Bern, 1930.

Ec7 (Sonderheft nr. 9 der Wirtschaftlichen und sozial-statistischen mitteilungen, hrsg. vom eidgen. Volkswirtschaftsdepartement. Contains Wirtschaftszahlen bis März 1930.

Annual statistics of milk production, 1920-1929. Figures for 1929 are preliminary.

Numbers of cattle and numbers of cattle, calves, and hogs slaughtered, 1920-1929.

Production of grain, potatoes, fruit, wine, 1920-1929.  
Monthly wholesale index numbers (animal food products)  
1927-1929.

Wholesale prices of milk, cheese, cattle, hogs, 1920-1929.

Prices paid by the Grain Administration for wheat, rye,  
spelt, 1920-1929; maslin, 1921-1929.

Wholesale prices of potatoes, pears (for cider), apples  
(for cider), 1920-1929.

Retail prices of table apples, 1920-1929.

Average prices of wine per hl., 1920-1929.

Gross return from the production of grain, potatoes, fruit,  
and wine, cattle raising, milk and dairy products, hog raising,  
poultry raising, 1920/21, yearly 1922-1929. Figures for 1929  
are preliminary.

Export statistics (quantity), hard cheese, condensed milk,  
fruit, cattle (numbers), 1920-1929.

Import statistics (quantity), butter, fodder, fertilizer,  
1920-1929.

Grain delivered to the Grain Administration (quantity),  
1920-1929. Figures for 1929 are preliminary.

Charts show the index of wholesale prices in Switzerland  
from 1926 to 1929 of animal food products, vegetable food  
products, food products for industrial use, textiles,  
fodder, fertilizer.

U.S.D.A. Switzerland. Département suisse de l'économie publique. Commission  
284.39 d'étude des prix. Publication 1- Berne, 1927-  
Sw6 1. La marge des prix dans le commerce du lait en Suisse.  
[1927]

For analysis of contents, see Switzerland. Volkswirt-  
schaftsdepartement. Rapports économiques de la feuille  
officielle suisse du commerce. 1926-1927. (LC HC395.A47)

See also Switzerland. Preisbildungskommission.

Switzerland. Département suisse de l'économie publique.

See also Switzerland. Eidgenössisches volkswirtschafts-  
departement, and Union suisse des paysans.

U.S.D.A. Switzerland. Eidgenössisches departement des innern. Statistisches  
262 bureau. Eidgenössische volkszählung vom 1. Dezember, 1920.  
St2E1 Kantonsweise ergebnisse... Hrsg. vom Eidg. statistischen  
1920 bureau. Bern [1923-24], 14 v.

Heft 4 (Uri, Schwyz, Unterwalden, Glarus, and Zug)

L.C. wanting in U.S.D.A.

HA1592 Numbers 5, 12, 13, and 14 published only in French; no. 11  
1920 only in Italian.

L.C. entry: Switzerland. Statistisches bureau.

Census of the population in 1920 by cantons. Workers in  
the open air include men and women engaged in agriculture;  
cattle and horse raising; viticulture; small livestock and  
poultry raising; beekeeping; horticulture, and forestry.



U.S.D.A. Switzerland. Eidgenössisches departement des innern. Statistisches  
262 bureau. Graphisch-statistischer Atlas der Schweiz. Hrsg.  
St2G. vom Statistischen bureau des eidg. departements des innern.  
Atlas graphique et statistique de la Suisse. Bern, Stämpfli  
L.C. & Cie., [1897] 96 p. (Schweizerische Statistik. Lfg. 110.)  
HA1593 Issued in place of the "Statistisches Jahrbuch" for the  
.A4 year 1897.  
Bern, Lips & Co., [1914] (Schweizerische  
Statistik. Lfg. 191.)

U.S.D.A. Switzerland. Eidgenössisches departement des innern. Statistisches  
262 bureau.  
St2Sm Schweizerische statistische mitteilungen. Bulletin de  
statistique suisse. jahrg. 1-11. 1919-1929. Bern, 1919-1929.  
L.C. Superseded by Statistische Quellenwerke der Schweiz.  
HA1591 L.C. entry: Switzerland. Statistisches bureau.  
.A3 Schweizerische statistische mitteilungen hrsg. vom Eidg.  
statistischen bureau... Bulletin de statistique suisse...  
Bollettino di statistica svizzera... Bern, 1920-  
The following numbers contain pertinent statistics:  
1919. Cahier 1. Lieu de domicile et lieu de travail de la  
population suisse d'après le recensement du 1er décembre 1910.  
Statistics of population in 1910; total; living in a  
commune but working outside it; working in one commune and  
living in another; by cantons, districts, and communes.  
1920. heft 2. II. Anbaustatistik der Schweiz. 1919.  
German, French, and Italian.  
Area cultivated in grain, hoed crops, vegetables, in-  
dustrial plants; numbers of producers, by cantons.  
Numbers of producers and area in wheat, rye, spelt,  
maslin, barley, oats, other grains, peas, beans, potatoes,  
fodder, beets, sugar beets, rape, vegetables, poppy, flax  
and hemp, chicory, tobacco. By districts and by communes.  
Comparative figures for 1917, by cantons.  
1920. Fasc. 3. X<sup>e</sup> Recensement du bétail de la Suisse,  
24 avril, 1919. French only.  
Numbers of horses, mules, asses, cattle, hogs, sheep,  
goats, and of their owners, by cantons, districts, and  
communes.  
1920. Cahier 7. Répartition, par groupes d'âge, de la  
population de la Suisse exerçant une profession principale  
d'après le recensement de 1910.  
1920. Cahier 8. Profession accessoire de la population  
en Suisse d'après le recensement de 1910.  
1920. Heft 10. XI. Viehzählung der Schweiz 21 April 1920.  
XI<sup>e</sup> Recensement du bétail de la Suisse, 21 avril 1920.  
German and French.  
Statistics of livestock as in 1920, fasc. 2.

1922. Cahier 1. Comptes de ménage de 277 familles suisses pour 1919.

The results are given of a study of budgets kept by 277 Swiss families in 1919. The expenditure for individual food products and the quantities of these consumed are given for families grouped by districts and professions.

1922. Fasc. 6.. XII<sup>e</sup> Recensement du bétail de la Suisse, 21 avril, 1921. French only.

Numbers of horses, mules, asses, cattle, hogs, sheep, goats by cantons, districts, and political communes; according to age, sex, and purpose for which intended, by communes.

Tables of livestock owners, according to occupation, kinds and number of livestock owned.

Numbers of horses, cattle, hogs, sheep, goats according to the census of 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921; also owners, according to numbers owned.

Livestock owners who are or are not farmers, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921.

1922. Heft 7. II. Nutzgeflügelzählung der Schweiz, 21. April, 1921. German, French, and Italian.

Numbers of hens, geese and ducks by cantons, districts, and communes, in 1921. Also numbers of owners. Comparative figures for 1918.

1924. Heft 7. Recensement fédéral de la population du 1<sup>er</sup> décembre 1920. Publication générale des résultats pour l'ensemble de la Suisse. Second fascicule. Statistique des professions.

Numbers of persons engaged in agriculture in an economic capacity, 1888, 1900, 1910, 1920; numbers engaged in agriculture according to age groups, 1880, 1888, 1900, 1910, 1920; numbers engaged in agriculture, by cantons, 1920.

1925. 1<sup>er</sup> Fasc. Recensement fédéral de la population du 1<sup>er</sup> décembre 1920. Publication générale des résultats pour l'ensemble de la Suisse. Profession accessoire et industrie à domicile.

Numbers of persons engaged in agricultural pursuits as a secondary occupation.

1925. Heft 3. II. Arealstatistik der Schweiz 1923/24. German, French, and Italian.

Statistics of area, productive (with and without forests), non-productive.

1925. Heft 4. Eidgenössische volkszählung vom 1. Dezember 1920. Recensement de la population suisse du 1<sup>er</sup> décembre 1920. German, French.

Classification, according to age, of persons engaged in economic activities.

1925. Heft 6. Recensement fédéral de la population du 1<sup>er</sup> décembre 1920. Publication générale des résultats pour l'ensemble de la Suisse. Premier fascicule. Résultats généraux.



1926. 1<sup>er</sup> Fasc. Recensement fédéral de la population du 1<sup>er</sup> décembre 1920. Publication générale des résultats pour l'ensemble de la Suisse. Troisième fascicule. Statistique des ménages.

1926. Heft 2. Eidgenössische volkszählung vom 1. Dezember 1920. Schweizerische industriekarten. Recensement fédéral de la population du 1<sup>er</sup> décembre 1920. Répartition géographique des industries suisses.

1927. Heft 3. III. Anbaustatistik der Schweiz. III<sup>e</sup> Statistique des cultures de la Suisse, 1926.

Numbers of producers and area cultivated on June 9, 1926, by cantons, districts, and communes (cereals, legumes, hoed crops, vegetables, industrial plants in 1926).

Area cultivated on June 9, 1926, by cantons, districts, and communes: cereals (wheat, spring and autumn; rye, spring and autumn; spelt; maslin; barley; oats; emmer; maize); root crops (potatoes; fodder beets; sugar beets; turnips); industrial plants (rape and rape seed; poppy; flax and hemp; tobacco).

1927. Heft 4. III. Nutzgeflügelzählung der Schweiz, 21. April 1926. III<sup>e</sup> recensement de la volaille de la Suisse, 21 avril 1926.

Numbers of poultry owners, with and without farms, with and without cattle; numbers of owners of hens and numbers of hens; numbers of owners of geese and ducks, and numbers of geese and ducks. By cantons, districts, and communes. Numbers of owners of hens (1 to six hens; 7 to 12 hens; 13 to 24 hens; 25 and more hens), by cantons, districts, and communes.

1927. Heft 7. VII. Zählung der bienenvölker der Schweiz, 21. April 1926. VII<sup>e</sup> recensement des ruches d'abeilles de la Suisse, 21 avril 1926.

Numbers of owners of bees, with and without farms, with and without cattle; numbers of beehives, with fixed combs; with movable combs on April 21, 1926, by cantons, districts, and communes. Numbers of owners with 1 or 2 hives; 3 to 10 hives; 11 and more hives.

1928. Heft 2. XIII. Viehzählung der Schweiz. XIII<sup>e</sup> recensement du bétail de la Suisse 1926.

Numbers of livestock owners, with and without farms; numbers of horses (less than 4 years old, 4 and more than 4 years old for breeding and for work); mules; asses; cattle (calves for slaughter, for raising; young cattle between 6 months and a year; heifers between one and 2 years old, over 2 years old; cows; bulls for breeding between one and 2 years old and over 2 years old); hogs (for breeding, boars, sows; for fattening; for raising, suckling pigs, others);

sheep; goats (kids for slaughter, for raising; he-goats; milk goats). By cantons, districts, and communes.

Comparative figures (numbers of horses, cattle, hogs, sheep, goats), 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1921, 1926, by cantons.

Numbers of livestock owners according to number of livestock owned, by cantons: Horses (1, 2, 3, or 4, 5 and more), 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921, 1926; Cattle (1 to 4, 5 to 10, 11-20, 21 and more) 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921, 1926; Hogs (1 to 3, 4 to 10, 11 and more) 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921, 1926; Sheep (1 to 5, 6 to 25, 26 and more) 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921, 1926; Goats (1 to 5, 6 to 25, 26 and more) 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921, 1926.

Owners of livestock, with or without farms, by cantons, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921, 1926.

1929. Heft 3. Die entvölkerung in den schweizerischen Hochtälern. Le dépeuplement des hautes vallées de la Suisse.

Statistics are given showing the decrease in population in the Alpine Valleys from 1850 to 1920.

U.S.D.A. Switzerland. Eidgenössisches departement des innern. Statistisches  
262 bureau. Statistische quellenwerke der Schweiz. Bern, 1930.  
St2Q Hft. 1-

German and French. Fasc. 3 in French only.

U.S.D.A. has 1-10, lacks fasc. 8.

L.C. has 1-10.

On Publication: Statistische Quellenwerke der Schweiz hrsg. vom Eidgenössischen Statistischen Amt... Hft 1- Statistiques de la Suisse publiées par le Bureau fédéral de statistique, 1<sup>er</sup> fasc.

Heft 4. Ergebnisse der schweizerischen obstbaumzählung (auf grund der betriebszählung vom 22. Aug. 1919). Résultats du recensement fédéral des arbres fruitiers (d'après le recensement des entreprises du 22 août 1929.)

Numbers of fruit trees according to the census of August 22, 1929, by cantons, districts, and communes (apple trees, pear trees, quince trees, cherry trees, plum and prune trees, apricot trees, peach trees, nut trees, other fruit trees, vines.)

U.S.D.A. Switzerland. Eidgenössisches departement des innern. Statistisches  
262 bureau. Statistisches jahrbuch der Schweiz... Annuaire  
St2S statistique de la Suisse... 1891-1929. Bern, 1891-1930.

L.C. In place of the yearbook for 1897 there was issued the  
HA1593 Graphisch-statistischer atlas der Schweiz... 1897. Atlas  
graphique et statistique.



Alphabetisches inhaltsverzeichnis der jahrg.  
1-10 (1891-1901) des Statistischen jahrbuches der Schweiz  
und des graphisch-statistischen Atlases vom jahre 1897...  
Index alphabétique de l'Annuaire statistique de la Suisse,  
tomes 1-10 (1891-1901) et de l'Atlas graphique et statistique,  
année 1897... Bern, Stämpfli & Cie., 1901.

Issued by Schweizerisches finanzdepartement. Statistisches  
bureau, 1914-1916; Eidgenössisches statistisches bureau,  
1917-1927; Eidgenössisches statistisches amt, 1928-1929.

L.C. entry: Switzerland. Statistisches bureau.

Contains statistics of:

I. Area, population, climate.

II. Economic conditions: statistics of area, production,  
yield of crops; livestock raising; farm management; import  
and export; prices and index numbers; consumption.

I.A) Area, total and by cantons: productive and non-  
productive land, 1877(1891-1902); 1901(1903-1910); 1909(1911);  
1912(1912-1913, 1915-1916); yearly, 1917-1924; 1923/24(1925-  
1929).

Under productive land are included woods and vineyards  
(1891-1929), a section including fields, gardens, meadows  
and pastures (1891-1902).

B) Population: Includes numbers engaged in agriculture  
by cantons, according to the latest census (1891-1929);  
Figures showing depopulation of the mountain valleys, 1929-  
(1929- )

C) Climate: Figures of 12 stations showing:

1. Atmospheric pressure (average, minimum, maximum);  
number of days with rainfall, snow, thunderstorms, fog,  
fair weather, cloudy weather. 1916- (1917- )

2. Relative humidity for each month (average,  
minimum) 1927-

3. Monthly Rainfall in millimetres.

a) total for each month 1916- (1917- )

b) deviation from the average of 1864-1900, 1916-  
1919 (1917-1919), 1864-1913 (1920- ).

c) largest 24 hour's rainfall per month, 1927-

4. Temperature: centigrade.

a) average for month 1916- (1917- )

b) deviation from normal 1916- (1917- )

c) maximum per month 1916- (1917- )

d) minimum per month 1916- (1917- )

5. Cloudiness, average per month 1917- (1917- )

6. Insolation:

a) number of hours of sunshine per month 1917-  
(1917- ) 7 stations.

b) normal insolation in hours per month 1885-1905  
(1918); 1886-1905(1919); 1886-1910(1920-1924);  
1886-1920(1925- ).

7. Average of a number of years of weather conditions (in days): rainfall, snow, thunderstorms, fog, fair weather, cloudy weather. (1918- )

8. Weather conditions registered at 3 stations 1918-1927(1927); 1918-1928(1928); 12 stations 1920-1929 (1929).

a) annual average, rainfall, temperature, insolation, atmospheric pressure.

b) number of days of rainfall, snow, thunderstorms, fog, fair weather, cloudy weather.

## II.A) Area, production, yield, etc.:

### 1. Land improvements.

Subventions from Confederation; cantons; communes, districts, and corporations; by cantons, 1886/1912(1917); numbers of projects; proposed expenditure; federal subsidies, allotted, paid, by cantons, 1920-1924 (1920-1924); comparative figures 1911-1924.

Expenditures for improvements on level ground, in the mountain regions; area covered; amount of subventions; (drainage, irrigation, road construction, etc.); 1886/1912(1917); 1913/1920(1920); 1885/1920(1921); yearly 1921-1928(1922-1929); for periods from 1885 (1925-1929); expenditures and subventions by cantons, 1913/20(1920); 1885/1920(1921); yearly 1921-1928(1922-1929); comparative figures 1921-1928(1929).

### 2. Area, production, yield.

Numbers of producers of bread grains, legumes and industrial plants, vegetables, hoed crops; area cultivated, total, barley, oats, maize, buckwheat, peas, and beans, cabbages and cauliflowers, etc., potatoes, turnips, carrots, by cantons, 1917(1917); area only, 1917(1918).

Numbers of producers of grain, bread grain; area, barley, oats, maize, wheat, rye, spelt, maslin, peas, beans, potatoes, beets (fodder, sugar), kohlrabi, turnips, carrots, rape, poppy, flax, hemp, by cantons, 1917, 1919(1919); grain, legumes, hoed crops, vegetables, industrial plants, bread grain, wheat, barley, oats, maize, by cantons, 1917, 1919(1920-1923).

Production (percentage of average return of 10 preceding years) grain and straw of wheat (autumn, spring), spelt, rye (autumn, spring), barley (autumn, spring), oats, maslin, maize, potatoes, beets, sugar beets, carrots, kohlrabi, turnips, tobacco, field vegetables, hay (natural and artificial meadows), pasture grass, apples, pears, cherries, prunes, nuts, wine, 1909-1929(1917-1929).

Production, apples, pears, cherries, cider, tobacco (quantity, value); comparative figures for 9



preceding years (Berne, Argovie, Vaud) 1916-1922 (1917-1923); apples, pears, cherries (Berne, Argovie), 1923-1925(1924-1926); 1927(1927); production, value, apples, pears, cherries, (Berne, Argovie, Vaud) 1911-1915(1914-1916)

Vines and wine: area, production, value, yield per hectare, average price per hl.; average value per hl., by cantons, 1893-1929(1894-1929); comparative figures for 9 to 11 years (1917-1929); area, production, by cantons, communes, and districts, 1905 (1906).

Milk production: cows' milk; goats' milk; used to feed stock; for use of producer; sold; made into cheese and other products, 1911-1917(1917); 1911-1922 (1922); 1911-1923(1923); 1912-1924(1924); 1915-1925 (1925); 1916-1926(1926); 1917-1927(1927); numbers of cows, goats; annual production per cow, per goat; total production of cow's milk, goat's milk; milk fed to stock; used by producer, by others; transformed into by-products, 1866; 1876; 1886; 1896; 1906; 1911; 1916; 1918-1928(1928); + 1929(1929).

Dairy products: cheese, butter, condensed milk, 1911-1917(1917).

Estimated monthly milk production, total, per day and per cow; consumption; for stock; by cantons, 1918 (1918)

Production, value, milk, butter, cheese, Zurich 1911-1915; Berne 1911; Vaud 1911-1915 (1914-1916)

Production, value, wheat, rye, maslin, barley, oats, straw, hay and artificial fodder, potatoes, carrots and beets, sugar beets, Berne, Vaud, 1911-1915(1914-1916)

Area in hectares, production in quintals, yield per hectare in quintals, estimated, wheat, spelt, rye, barley, oats, maize, potatoes, sugar beets, tobacco, comparative figures for 9 to 14 years, 1921-1929(1921-1929)

Grain delivered to Confederation; retained by producers (quantity, value), by cantons, 1927, 1928 (1928); 1928, 1929(1929)

Production, value, average price per hl. of cider, Argovie, Vaud, 1911-1915(1914-1916).

Production, value, average price per quintal of tobacco, Berne, Fribourg, Vaud, 1911-1915(1914-1916).

The statistics of area, production, and yield of crops for Switzerland as a whole begin with 1917. For the preceding years the statistics are issued by separate cantons.

Aargau (Argovie)

Area of productive land (fields, meadows, vineyards, marshes, forests), 1888 (1891-1892).

Production, value, apples, pears, cherries, 1887-1913 (1891-1913).

Vines and wine, area; production, value, 1887-1913 (1891-1913).

Cider, production, value, average price per hl., 1893-1913 (1894-1913).

Dairy products, number of milk producers, number of cows, milk delivered to cheese factories in summer, in winter, amount sold, amount made into cheese; production of cheese, butter; value of cheese, butter, 1887-1901(1891-1905).

Born (Berne)

Grain (wheat, spelt, rye, barley, oats); straw; root crops (potatoes, beets and kohlrabi, carrots); fodder crops (clover, lucerne, sainfoin, other grasses); vegetables (cabbage, peas, beans); industrial plants (rape, hemp, flax, chicory, tobacco); meadow hay; area, except straw, 1888(1891); 1889, 1890(1892); 1890, 1891(1893); 1890, 1892(1894); 1890, 1892(1895); 1892, 1895(1896); 1893-1895(1898-1900); 1895(1901-1905); 1904(1906-1911); 1910(1912). Production and value, 1888-1911 (1891-1912); comparative figures for 1 to 4 preceding years (1892-1912).

Sugar beets, area, 1895(1896, 1898, 1899, 1903-1905); 1904 (1906-1911); 1910(1912); production, value, 1895-1911(1896-1912).

Fruit trees, numbers 1888-1892(1891-1902); production, value in francs, apples, pears, cherries, plums, walnuts, 1888-1911 (1891-1912).

Vines and wine. Owners of vineyards, by districts, 1888 (1891); 1900-1913(1903-1913). Area, numbers of workers employed, production, value, capital value of vineyards, by districts, 1888-1913(1891-1913); price per hl., 1881-1892 (1894)

Milk and milk products. Number of cheese factories; quantity and value of milk delivered to cheese factories, sold, made into cheese; average price of milk per hl., by districts, 1883(1891); quantity and value of cheese on the market, average price of cheese, by districts, 1883(1891).

Production, consumption, import of milk; surplus production; quantity delivered to cheese factories; quantity used on the Alpine farms; quantity sent to cities for consumption; value in francs of production of cheese, butter, milk (condensed, sterilized, powdered), by districts and regions, 1911 (1912).

Average production, yield, price, value of wheat, spelt, rye, barley, oats, straw, potatoes, beets and kohlrabi, carrots, clover, lucerne, sainfoin, mixed fodder, cabbage, peas, beans, rape, hemp, flax, chicory, tobacco, hay, apples, pears, cherries, plums, walnuts during the decennial period, 1885 to 1894.



Freiburg (Fribourg)

Dairy products: milk delivered to cheese factories; quantity of cheese produced, by districts, 1883-1887 (1891-1894)

Tobacco, area, production, value, by districts, 1885, 1888(1891); 1888-1890 (1892-1894); area, production, selling price, value, by communes and districts, 1894-1913(1895-1913).

Neuenburg (Neuchâtel)

Vines, and wine, area, production, by communes, 1889-1890 (1891-1893); area; production, price per liter, value (white wine, red wine), 1884-1889 (1891); 1884-1890(1892); 1884-1891 (1893).

Schaffhausen (Schaffhouse)

Area, production, value, wheat, spelt, rye, barley, oats, legumes, potatoes, beets, kohlrabi, turnips, carrots, chicory, clover, sainfoin, lucerne, fodder rye, vetch, meadow hay, hops, tobacco, hemp, flax, rape, poppy; production, value, straw, 1884(1891-1895).

Fruit trees (apple, pear, walnut, plum, cherry), numbers according to ages, 1886(1891-1892).

Vines and wine, area; production, value of red and white wine; total yield per hectare in hl., 1895-1912(1891-1913); value of wine production in francs, 1892-1912 compared with that of a number of previous years, beginning with 1858 (1895-1913).

Thurgau (Thurgovie)

Fruit trees (apple, pear, cherry, plum, walnut) numbers according to age, 1884(1891-1892).

Vines and wine, area, production, value, 1868(1891-1892).

Area, fields, meadows, peatland and marshes, grain, root crops, fodder crops, wheat, spelt, rye, barley, oats, potatoes, beets, carrots, clover, lucerne, sainfoin, rape and poppy, hemp and flax, peas and beans, vegetables, hops and tobacco, by districts, 1890(1893-1895)

Production, value, wheat, spelt, rye, barley, oats, straw, potatoes, beets, carrots, kohlrabi, clover, lucerne, sainfoin, peat, marsh grass, hay, by districts, 1890(1894-1895).

Waadt (Vaud)

Production, average price per quintal, value, wheat, rye, maslin, barley, oats, straw, maize, peas and lentils, beans, potatoes, carrots and beets, hay, rape, flax and hemp, hops, tobacco, 1883(1891); wheat, rye, maslin, barley, oats, maize, straw, hay, potatoes, carrots and beets, 1889-1899(1892-1901); sugar beets, 1893-1896(1895-1901).

Area, wheat, rye, maslin, barley, oats, 1892-1899(1893-1901).

Production, value, wheat, rye, maslin, barley, oats, maize, straw, hay, potatoes, carrots and beets, 1898-1913(1902-1913).



Fruits (apples and pears, cherries, plums and prunes, walnuts, chestnuts), production, value, 1888-1913(1891-1913); average price per quintal, 1888-1899(1891-1901).

Vines and wine, area, production, average price, value of white wine, red wine, brandy, 1888(1891); area, production, average price, value of white wine, red wine, 1880-1890(1892); 1880-1891(1893); 1880-1892(1894); 1880-1893(1895); 1880-1894(1896); 1881-1895(1898); 1882-1896(1899); 1882-1897(1900); by districts, 1893-1913(1894-1913).

Milk, butter, cheese, production, value, 1888-1913 (1891-1913); comparative figures for a varying number of preceding years.

Tobacco, production by districts, value, 1881-1913(1892-1913).

Value of land (fields and gardens; meadows and orchards; pastures; forests; vineyards), by districts (1896).

#### Zurich.

Grain (wheat, spelt, rye, barley, oats, maslin); straw; root crops (potatoes, beets, carrots, turnips, kohlrabi); fodder crops (clover, lucerne, sainfoin) other grasses; hay (good medium, poor quality); peatland; marshes; area, except straw, 1885 and 1888(1891); 1885 and 1889 (1892,1893); 1891(1894-1896); 1893(1898); 1893 and 1896(1899, 1900); 1896(1901-1911); sugar beets, 1895-(1896) Production, yearly 1888-1891(1891-1894); 1888-1892(1895); 1889-1893(1896); 1891-1895(1898); 1891-1896(1899); 1893-1897(1900); 1898-1907, with comparative figures for 4 preceding years (1901-1911). Value in francs, 1888(?) (1891); 1889(1892); 1890(1893); 1891(1894); 1888-1892(1895); 1889-1893(1896); 1891-1895(1898); 1891-1896(1899); 1893-1897(1900); 1898-1907, with comparative figures for 4 preceding years (1901-1911).

Vines, area, production, yield, value, 1887-1913; by districts, 1888-1913(1891-1913); each vol. has comparative figures for 2 preceding years; average yield in hectolitres per hectare, gross value in francs, per hectare 1874-1913 (1891-1913); each vol. has comparative figures for from 14 to 21 years.

Fruit Trees. Numbers of apple trees, pear trees, cherry trees, plum trees, walnut trees, 1888(1891); number of productive trees according to census of 1886(1892-1911); production of apples, pears, cherries, plums, walnuts, in quintals; value in francs, 1888-1907(1891-1911).

Cheese, Butter, Milk. Production of butter, cheese; average price per quintal; value, 1888-1912(1891-1913);

Numbers of cheese factories, by kind of cheese produced, 1888-1912(1891-1913).

Milk. total amount delivered amount delivered to private persons, to cheese factories; average price per quintal; value, 1888-1912(1892-1913).



Prices of grain (minimum, maximum, average), by decennial periods, 1540-1889.

B. Livestock:

Numbers of horses, cattle, cows, hogs, sheep, goats, 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920 (1920); + 1921(1921-1924) + 1926(1925-1929)

Numbers of horses, cattle, cows, mules, asses, hogs, sheep, goats, by cantons, 1876, 1886(1891); 1886(1892-1895); 1896, comparative figures for whole country for 1866, 1876, 1886 (1896); by cantons and districts, 1901, comparative figures for whole country for 1866, 1876, 1886, 1896(1901); by cantons 1901(1902); by cantons and districts 1901(1903); without mules and asses (1904); horses, mules, asses, cattle, hogs, sheep, goats, by cantons; 1906, comparative figures for whole country for 1866, 1876, 1886, 1896, 1901 (1908); horses, cattle, hogs, goats, by cantons, 1866, 1876, 1886, 1896, 1901, 1906(1909); horses, mules and asses, cattle, hogs, sheep, goats, 1905(1910); horses, mules, asses, cattle, hogs, sheep, goats, by cantons 1911(1912-1913); bees 1911(1914); detailed statistics of numbers of livestock, 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916 (preliminary figures 1916) horses, mules and asses, cattle, cows, hogs, sheep, goats, by cantons, 1916, comparative figures for whole country for 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916(1917-1918); horses, mules, asses, cattle, cows, hogs, sheep, goats, by cantons, 1919(1919); horses, cattle, cows, hogs, sheep, goats, by cantons, 1920(1920); 1921(1921-1924); 1926(1925-1929).

Numbers of owners of livestock, according to categories and by cantons (1891- ); total for Switzerland, 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1918, 1919, 1920, 1921, 1926 (1926-1929).

Numbers of dogs, by cantons, 1896(1898).

Import and export of livestock, animal and dairy products (horses, mules, asses, cattle (by weight), hogs, sheep and goats, meat, (fresh, salted, smoked, etc.), hides, skins, milk, (fresh, condensed,) lard, butter, cheese), 1885, 1886, numbers and value, countries of origin and of destination (1891); 1887-1890(1892); 1887-1891(1893); 1892, 1893(1894); 1892-1894(1895).

Annual statistics of import and export of livestock (horses, colts, asses, mules, cattle, calves, hogs, goats, sheep and lambs) 1851-1886(1891).

Value of livestock, total and average, by cantons (horses, mules, asses, cattle, cows, hogs, sheep, goats, beehives). 1896; total value for Switzerland, 1876, 1886, 1896(1899); 1901(1905).

Average prices per head (horses, mules, asses, cattle, hogs, sheep, goats), 1876, 1886, 1896(1899); beehives, 1886, 1896 (1899).

Livestock insurance statistics, 1888(1891); 1889, 1890(1892); 1891(1893); 1892(1894); 1893(1895); 1894(1896); 1895(1898);



1896, 1897(1899); 1898(1900); 1899(1901); 1900- (1902- )  
in canton Zurich 1896, 1897(1899).

Livestock diseases 1889- (1891- )

Premiums paid by cantons for bulls and bull calves, cows and heifers 1884-1893; total federal subsidies for improvement of cattle, 1884-1893; extra federal premiums for bulls and bull calves; federal subsidies for horse breeding, 1884-1893(1894).

Livestock slaughtered (oxen, bulls, heifers, cows, calves, hogs, sheep, goats, horses) by localities, 1899(1900); 1917- (1917- ).

Numbers of beehives, by cantons, 1876, 1886(1891); 1876, 1886, 1896(1896); 1901(1902-1905); 1876, 1886, 1896, 1901, 1911(1913); with fixed or mobile combs 1911(1914, 1917); 1918(1918-1922), total numbers 1918(1923); 1876, 1886, 1896, 1901, 1911, 1918, 1926(1926-1929).

Numbers of beehive owners, by cantons, 1896(1898); 1901 (1902-1905); 1911(1914; 1917); 1918(1918-1922); 1876, 1886, 1896, 1901, 1911, 1918, 1926(1926-1929).

Numbers of fowls, geese and ducks, 1918(1923); by cantons, 1918, 1921, 1926(1926-1929).

Detailed statistics for separate cantons.

Aargau.- Number of horses, mules and asses, calves, cows, bulls, oxen, hogs, sheep, goats, by districts, 1892-1894(1894-1895).

Number of horses, cattle, cows, sheep, goats, hogs, 1816-1894(1894-1895).

Freiburg.- Numbers of horses, mules, asses, calves, cows, bulls, oxen, hogs, sheep, goats, 1884-1894; numbers slaughtered for consumption, 1884-1894(1894-1895).

Geneva.- Numbers of horses, mules, asses, calves, cows, bulls, oxen, hogs, sheep, goats, 1889-1893(1894-1895).

Neuchâtel.- Numbers of horses, mules, asses, calves, cows, bulls, oxen, hogs, sheep, goats, 1884-1893(1894-1895).

Vaud.- Numbers of horses, cattle, sheep, goats, hogs, 1859-1894(1894-1895).

### C) Farm Management.

Annual gross return per hectare on various kinds of farm operations with comparative figures for 9 preceding years, 1921-1928(1922-1929); gross return per hectare, by group sizes, 1921/22-1928/29 (1922-1929).

Cost of production per hectare (itemized), 1913-1928 (1922-1929); by group sizes, 1921/22-1928/29(1922-1929).

Annual net return per hectare, 1913-1928(1922-1929); by group sizes, 1921/22-1928/29(1922-1929).

Proportion retained for farmers' use and proportion marketed of potatoes, grain, vegetables, fruits, vineyard products, forest products, cattle, milk, hogs, beekeeping products, by group sizes, 1921-1928 and average for period since 1908 (1922-1929).



Capital invested (itemized) by group sizes, 1921-1928, and average for period since 1901(1922-1929).

Agricultural indebtedness (itemized), by group sizes, 1921-1928 and average for period since 1901(1922-1929).

Capitalized value of property, by group sizes, 1921-1928 and average for period since 1901(1922-1929).

D) Import and Export:

Annual statistics of import and export (quantity, value, country of origin and of destination) 1889- (1891- Import figures for 1889 are for value only).

Transit trade 1889- (1891- )

E) Prices and Index Numbers:

Annual prices (minimum, maximum, average) of potatoes, apples, pears, chestnuts, butter, eggs, bread, 1891(1892); average maximum and minimum prices, 1892(1893).

Annual prices (minimum, maximum, average) of beef, veal, pork, mutton, lard, fowls, pigeons, 1891(1892); average maximum and minimum prices, 1892(1893).

Monthly prices (maximum, minimum) of potatoes, butter, eggs, 1893(1894); 1894(1895).

Annual prices of wood (maximum, minimum, average); in Berne and Geneva, 1891(1892); 1892(1893).

Monthly prices (maximum, minimum) of grain (wheat, rye, barley, oats, maize), flour, bran, bread in Berne, 1891-1911(1892-1912).

Average decennial prices of grain in the canton of Zurich, 1540-1888(1892).

Prices of agricultural products, grain (wheat, rye, spelt), potatoes, tobacco, wine, fruit (apples, pears, cherries), vegetables (carrots, cabbage, green beans) hay, hemp, flax, cattle, hogs, meat (beef, veal, mutton), eggs, honey, milk, butter, cheese, 1885/88; 1885/91; 1892/98; yearly 1899-1903 (1904); + barley, oats, pork, lard, + 1904(1906); 1889-1906 (1907); 1889-1907(1908); 1892-1908(1909); 1903-1909(1910).

Index numbers for same periods, grain, potatoes, tobacco, wine, fruit, vegetables, hay, hemp and flax.

Prices of beef, veal, pork, 1893, 1896, 1900, 1905, 1906 (1906).

Average annual wholesale prices of wheat, spelt, rye, oats, fodder barley, hay, clover, straw, potatoes, cider, must, brandy, cows, cattle, oxen, calves, goats, hogs, sheep, butter, eggs, rabbits, kids, honey, beeswax, by cantons, 1911-1927; + apples, pears, wood, 1912-1927; + fowls, 1920-1927.

Average monthly prices in comparable districts of products as listed in previous table, 1911-1924.

Prices of milk, for cheese manufacture, by cantons, 1912-1927.

Prices of milk for consumption, wholesale, retail, by cantons, 1912-1924.

Average quarterly price of milk 1913-1927.



Cheese, producers' price (average, minimum, maximum), comparative figures for 3 or 4 preceding years, 1914-1924; comparative figures for preceding year, 1925-1927.

Retail prices of consumers' cooperatives for agricultural products, March, June, September, December, 1914-1919(1915-1919).

Cost of living of a normal family of 2 adults and 3 children under ten, March, June, September, December, 1914-1919(1915-1919).

Cost of living, index numbers, March, June, September, December, by cantons, 1915-1918(1916-1918).

Retail prices and price increases, April 1914, April 1917, April 1918, by cantons, pork, lard, fat, beef, bread, flour, milk, butter, cheese, eggs, sugar, potatoes, by communes (1917).

Retail prices, January, April, July, October, beef, veal, pork, horse meat, lard, fat, butter, cheese, milk, rice, eggs, sugar, potatoes, beans, peas, dried apples, pears, plums, wood, 1919-1921.

Maximum federal prices 1914-1920(1919-1920).

Monthly cost of living in principal cities, July-December, 1919(1919); Jan.-Dec., 1920(1920).

Average retail prices, March, June, September, December, beef, veal, pork, lard, fat, milk, bread, eggs, potatoes, butter, cheese, flour, rice, oat flakes, sugar, beans, peas, lentils, dried apples, pears, plums, wood, 1922-1923.

Index numbers, agricultural products, 1908-1917(1918); 1909-1918(1919); 1906-1919(1920); 1907-1920(1921); 1908-1921(1922); 1909-1922(1923); 1909-1923(1924); 1910-1924(1925); 1911-1925(1926); 1912-1926(1927); 1913-1927(1928); 1919-1928(1929).

Average monthly prices of livestock and meat, 1923-1924(1923-1924).

Average annual retail prices, by communes, of beef, veal, pork, lard, fat, milk, bread, eggs, potatoes, butter, cheese, flour, 1924-1929(1924-1929).

Average monthly retail prices in 33 or 34 communes, Jan., 1921-Dec., 1924(1924); Jan. 1922-Dec., 1925(1925); Jan. 1923-Dec. 1926(1926); Jan. 1924-Dec. 1927(1927); Jan. 1925-Dec. 1928(1928); Jan. 1926-Dec. 1929(1929).

Annual average wholesale prices of grain, hay, straw, apples, pears, cider, cows, cattle, calves, goats, hogs, oxen, sheep, eggs, rabbits, kids, honey (also retail price), beeswax (also retail price), milk (also retail price), butter, cheese, 1914, 1925-1928(1928); 1914, 1925-1929(1929).

Index numbers of import prices, by categories of commodities, 1926-1929(1929)

#### F) Consumption

Meat, domestic, foreign, per kg. 1917(1917); 1915-1918(1918); 1916-1919(1919); 1916-1920(1920); 1916-1921(1921); 1917-1922(1922); 1918-1923(1923); 1918-1924(1924); 1918-1925



(1925); 1918-1926(1926); 1919-1927(1927); 1919-1928(1928);  
meat, poultry, meat and poultry products, frozen meat, total,  
per capita, 1924-1929(1929).

Meat and meat products, milk and milk products, milk,  
butter, and fat, cheese, grain and potatoes, grain, potatoes,  
1912(1918); meat and meat products; poultry, fish, and game;  
eggs and honey; milk; butter, fat and oils; cheese, bread  
and flour; potatoes; maize; rice; oats and oat products;  
barley; fruits; vegetables; chocolate; sugar; coffee, tea;  
sago and soups, 1917(1918)

Milk, see milk, production and consumption.

U.S.D.A. Switzerland. Eidgenössisches departement des innern. Statistisches  
262 bureau. Statistique du commerce de la Suisse. Notice  
27N explicative sur les tableaux comparatifs de la statistique  
du commerce suisse, embrassant la période 1885 à 1895.

L.C. Berne, Impr. S. Collin, 1897. 52p.

HF3701 L.C. entry; Switzerland. Statistisches bureau.

.A3 1897a Contains a running account of import and export of various  
commodities during the period covered, with a few instances  
of definite figures for certain years. Figures showing the  
importation of cattle and hogs are given annually from 1885  
to 1896.

L.C. Switzerland. Finanz-und zolldepartement. Schweizerische  
HF3701.A3 handelsstatistik. Specialhandel mit den einzelnen ländern  
1902 in den jahren 1892-1901. Commerce spécial avec les divers  
pays pendant les années 1892-1901. Bern, Buchdr. A. Benteli,  
1902. 215p.

Annual statistics of import and export (value), 1892-1901.  
By countries.

L.C. Switzerland. Finanz-und zolldepartement. Schweizerische Handels-  
HF223 statistik. Warenverkehr der Schweiz mit dem Auslande 1885-  
.A27 1890. Hrsg. vom Schweiz. Zolldepartement. Statistique du  
commerce de la Suisse. Mouvement des marchandises de la  
Suisse avec l'étranger 1885 à 1890... Bern, Typ. S. Collin,  
1891. 9lp.  
German and French.

Annual statistics of import and export (quantity, value),  
1885-1890.

L.C. Switzerland. Finanz-und zolldepartement. Uebersichtstabelle der  
HF223 ein-, aus-und durchfuhr. Mit Angabe der Grenzstrecken, über  
.A3 welche dieser verkehr stattgefunden hat. Hrsg. vom  
schweizerischen zolldepartement. [Bern 1857-85]. 1856-1884  
have t.-p. and text in German, French, and Italian.

L.C. has 1856, 1858, 1867, 1868, 1870, 1873, 1876-1879,  
1881-1884.

Annual statistics of import, export, and transit. (Quantity;  
Frontiers over which commodities passed.)



Switzerland. Finanz-und zolldepartement. See also Switzerland.  
Zolldepartement.

L.C. Switzerland, Laws, statutes, etc.  
HD2031.A5      Législation fédérale relative à l'agriculture. Pub. par  
1909a      le Département fédéral de l'agriculture. Lucerne, Impr.  
H. Keller, 1909. 266p.  
Published also in German.

L.C. Switzerland. Preisbildungskommission. 1.-publication de la  
HC395      Commission d'étude des prix, instituée auprès du Département  
.A32      fédéral de l'économie publique. Berne, [1927]-  
(Volkswirtschaftsdepartement. Rapports économiques et  
statistiques sociales. 1., 3.4. supplément)  
Published also in German.  
No. 1, without series note, issued as supplement to  
Rapports Économiques de la Feuille Officielle Suisse du  
Commerce, 1927.

Issued also as "Supplément de la Feuille Officielle  
Suisse du Commerce."

1. publication. La marge des prix dans le commerce du  
lait en Suisse. [1927]

U.S.D.A.      For analysis of contents see Switzerland. Volkswirtschafts-  
284.39      departement. Rapports économiques de la feuille officielle  
SW6      suisse du commerce. 1926-1927. (LC HC395.A47)

2. publication. Contribution à l'étude des prix du pain  
en Suisse. 1928.

3. publication. La marge des prix dans le commerce suisse  
de la boucherie et de la charcuterie. 1929.

(Suppl. de la Feuille Officielle Suisse du Commerce.)

4. publication. Production et commerce du ciment en  
Suisse. 1929.

(Suppl. de la Feuille Officielle Suisse du Commerce.)

L.C. Switzerland. Preisbildungskommission. Veröffentlichung nr.  
HC395      1-(4) der preisbildungskommission des eidgenössischen  
.34      volkswirtschaftsdepartementes. Bern, [1927]-

(Volkswirtschaftsdepartement. Wirtschaftliche und  
sozialstatistische mitteilungen. Sonderheft 1,3,4)

Published also in French.

No. 1, without series note, issued as supplement to  
Wirtschaftsberichte des schweizerischen Handelsamtsblattes,  
1927.

Issued also as "Beilage zum schweiz. Handelsamtsblatt."  
nr. 1. Die verschleisspanne [!] im milchhandel der  
Schweiz. [1927]

nr. 2. Die brotpreisverhältnisse in der Schweiz. 1928.

nr. 3. Die verarbeitungs-und verschleisspanne im fleisch-  
und fleischwarenverkehr der Schweiz. 1928.

nr. 4. Zementerzeugung und zementhandel in der Schweiz.  
1929.

Switzerland. Preisbildungskommission. See also Switzerland.  
Département suisse de l'économie publique. Commission  
d'étude des prix.

L.C.  
HA1595  
.A5  
Switzerland. Statistisches bureau.  
Die gesamtbevölkerung der gemeinden in der Schweiz. La  
population des communes de la Suisse. Vom Statistischen  
bureau des eidgenössischen Departements des innern. Par le  
Bureau de statistique du Département fédéral de l'intérieur.  
Bern, Buchdruckerei Stämpfli & Cie., 1901. 31p.  
At head of title: Gültige ergebnisse der eidgen.  
volkszählung vom 1. Dezember 1900. Résultats définitifs  
du recensement fédéral de la population du 1<sup>er</sup> décembre  
1900.  
Statistics of population by cantons, districts, and  
communes, December 1, 1900.

L.C.  
HA1592  
1889  
Switzerland. Statistisches bureau.  
Résultats définitifs du recensement fédéral de la population  
du 1<sup>er</sup> décembre 1888. La population totale des communes. Par  
le Bureau de statistique du Département fédéral de l'intérieur.  
Berne, Impr. Stämpfli, Lack, Scheim & Cie., 1889. 28p.  
Total population figures by cantons, districts, and  
communes, December 1, 1888.

L.C.  
HD9433  
.S94G7  
1866  
Switzerland. Statistisches bureau.  
Résultats du recensement du bétail de la Suisse du 21  
avril 1866 dans le canton des Grisons. Publi par le Bureau  
de statistique du Département fédéral de l'intérieur. Berne,  
Orell, Fuessli & Cie, à Zurich, 1867. 12p.  
Numbers of livestock on April 21, 1866 in Switzerland.  
as a whole and in the canton of Grisons by districts and  
circles: horses (2 years old and more; less than 2 years  
old; mares with colts; 4 years old and more; less than 4  
years old); asses and mules; cows; cows with calf; draft  
and slaughter oxen; more than 6 months old; less than 6  
months old; hogs (boars, sows, hogs for fattening; suckling  
pigs); sheep, goats.

L.C.  
HA1592  
1891  
Switzerland. Statistisches bureau.  
Résultats par commune du recensement fédéral de la  
population du 1<sup>er</sup> décembre 1888. [Berne, 1891]. 183p.  
Statistics of population by cantons, districts, and  
communes, December 1, 1888.

L.C.  
HA1591  
Switzerland. Statistisches bureau.  
Schweizerische statistik. 1-217, 1860-1919.  
Bern, 1862-1919.  
Hrsg. vom Statistischen bureau des eidg. Departements des  
innern.



In German, French, German and French, or French and Italian, or all three.

Certain numbers of this set (80,86,93,etc., etc.) which form the "Statistisches Jahrbuch der Schweiz...Annuaire Statistique de la Suisse, 1891- "; the "Graphisch-statistischer atlas...1897", and the alphabetical index to these publications (Bern,1901) are classified separately (HA1593.A4 in L.C. 262St2S in U.S.D.A.)

Other numbers containing the same kinds of statistics have been classified as separate sets by the Department of Agriculture. The call numbers for these are indicated in the margin.

Superseded by Schweizerische Statistische Mitteilungen.

Agricultural and Industrial Enterprises, Census. 1905.

Ergebnisse der eidgenössischen betriebszählung vom 9. August 1905. Recensement fédéral des entreprises. (Livr. 154,168,176, 181)

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U.S.D.A. entry: Switzerland. Eidgenössisches departement des innern. Statistisches bureau. Ergebnisse der eidg. betriebszählung vom 9. August 1905. Bd. 1-4. v.1 in 8 parts.

Text in French and German. v.1, pt.6 in Italian only.

V.1. (Livr.154) Contains numbers of enterprises and of persons employed in them, by cantons.

V.2. (Livr.168) Contains more detailed statistics of agriculture and forestry. Numbers of owners (individual, or groups); enterprises classified according to their personnel; numbers engaged in agricultural work according to kind of work done, age, and sex; enterprises employing seasonal labor; enterprises classified according to numbers and kind of livestock; numbers of horses, mules and asses, cattle, hogs, sheep, goats; numbers of enterprises using motors; numbers of motors employed compared with number of workers; machinery and equipment; enterprises classified according to ownership or tenancy; enterprises classified according to utilization of the soil; numbers of land parcels; area of land according to utilization; cultivated land according to area and ownership.

Alpine Farming.

10. Économie alpestre de la Suisse en 1864.

Contains an outline of the programme adopted on February 23, 1863, by the Swiss Society for Alpine Economy, for an improvement in the administration and cultivation of Alpine farms.

Statistical tables covering the year 1864, by cantons, districts, and communes, giving the following information: numbers of owners of Alpine farms; area; rating of the number of pasture areas; livestock admitted to summer pasturage (cows, (milk, non-milk), bulls, oxen, heifers, calves, horses, colts, sheep, goats, hogs, others); height above sea level;



period of summer pasturage (in weeks, in days).

Value per area allotted to one cow; revenue per cow in milk (per can of 3 litres), cheese, butter, whey; total revenue per cow; expense per cow; net revenue per milk cow; total revenue from cows, other livestock; net revenue from the Alpine farm.

Number of Alpine farms and of pasture areas per cow and average number of pasture areas for one cow per farm, by cantons, districts, and communes.

Money value of Alpine farms belonging to communes, communes and individuals, corporations, individuals, by cantons, districts and communes.

Price of location of above.

Revenue from the cows; number of milk cows; number of days milk cows were on summer pasture; return in milk per cow and per day; net return from cows (total, average per cow and per day), by cantons, districts, and communes.

Milk used for manufacture of cheese, butter, used as milk; prices (maximum, average, minimum) of cheese, butter; average cost of manufacture of cheese, butter, by cantons and districts.

Total and average revenue from the Alpine farms owned by communes, communes and individuals, corporations, individuals, by cantons, districts, and communes.

Crops. Area. Production. (Livr. 184, 208, 209)

184. Schweizerische arealstatistik. Abgeschlossen auf 1. Juli 1912. Statistique de la superficie de la Suisse. Arrêtée le 1<sup>er</sup> juillet 1912.

U.S.D.A. entry: Switzerland. Eidgenössisches departement des innern. Statistisches bureau.

Statistics of area of productive and unproductive land in 1912, by cantons, districts, and communes. The productive area is classified as agricultural, viticultural and Alpine land, including gardens and forest land.

208. Schweizerische anbaustatistik von jahre 1917.

Statistique suisse des cultures en 1917. Statistica svizzera delle coltivazioni nel 1917. German, French, and Italian.

U.S.D.A. entry: Switzerland. Eidgenössisches departement des innern. Statistisches bureau. Anbaustatistik der Schweiz.

Numbers of cultivators and area cultivated in grain (wheat, spelt, rye, barley, maslin, oats, emmer, maize, buckwheat), peas, beans, potatoes, fodder beets, sugar beets, kohlrabi, turnips, carrots, cabbage, cauliflower and Brussels sprouts, rape, poppy, flax, hemp, chicory, tobacco, by cantons, districts, and communes, in 1917.

209. Switzerland. Eidgenössisches departement des innern. Statistisches bureau. Ergebnisse der kartoffelbestandsaufnahme ...und der erhebung über die kartoffelanbauflächen... Résultats de l'enquête sur les stocks de pommes de terre...et

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les surfaces destinées à la culture des pommes de terre...  
1918- Berne, 1918- (Schweizerische statistik, 209.  
Lieferung. Statistique de la Suisse, 209° Livraison)  
German. French. Italian.

A survey of potato stocks on hand on January 17, 1918  
and of the area to be planted in potatoes in 1918.

I. Stocks of potatoes (for food, for seed, for fodder)  
by cantons. Total and per capita requirement for food;  
extent to which it is covered by the supply. Area required  
to be planted by the Confederation; area insured; area not  
yet insured. Total and per capita requirement of seed  
potatoes. Extent to which it is covered by the supply.

II. Stocks of potatoes (for food, for seed, for fodder)  
by political communes. Area to be planted in 1918. Minimum  
requirement for householders and producers. Quantity lacking  
for householders and producers.

A survey of potato stocks on hand on January 10, 1917  
and of area planted in 1916 and 1917 is contained in Livr.  
203 which is not in L.C. or in U.S.D.A.

Import and Export. (Livr. 4, 5, 7, 23, 29, 30, 33, 41, 42, 43,  
46, 48.)

4. Commerce de la France avec la Suisse pendant les onze  
années 1851-1861.

Annual statistics of export and import (quantity, value)  
between France and Switzerland, 1851-1861. (Starch, cattle,  
butter, fresh or melted, wood, floss silk, coffee, cereals  
and wheat (seeds), horses, cigars and manufactured tobacco,  
raw cotton, brandy and spirits of wine, wheat flour, fodder,  
cheese, seeds, fats, oils, indigo, wool, hides, skins, hair;  
raw silk, raw sugar, refined sugar, wine.)

5. Handel der Schweiz mit dem Königreich Italien. Commerce  
de la Suisse avec le Royaume d'Italie.

Statistics of export and import (quantity) between Italy  
and Switzerland from Swiss documents, 1860, 1861, 1862, 1863,  
(quantity and quality) from Italian documents, 1860, 1861,

7. Waarenverkehr der Schweiz mit besonderer rücksicht  
auf den deutschen Zollverein und Oesterreich. Commerce de  
la Suisse en vue spéciale du commerce avec l'Association  
douanière allemande et l'Autriche.

Annual statistics of import, export and transit (France,  
German customs Union, Austria, Italy), 1860-1863.

Annual statistics of export and import (quantity) between  
the German customs Union and Switzerland, 1858-1863; (value)  
1862.

Annual statistics of export and import (value) between  
Austria and Switzerland, 1854, 1858-1862.

Annual statistics of commodities exported from Switzerland  
and passing through France and of those imported into  
Switzerland after transit through France (quantity, value),  
1848-1862.



Annual statistics of commodities exported from Switzerland and passing through Italy and of those imported into Switzerland after transit through Italy (value), 1852-1861.

Annual statistics of export and import (quantity, value) between Switzerland and France, 1840, 1850, 1860. (cotton and silk in various forms)

Annual statistics of export and import (value) between Switzerland and the German Customs Union, 1840, 1851, 1862 (silk, cotton, wool, flax and hemp, cheese, cattle, wine, must and cider, brandy and liqueurs, tobacco, raw and manufactured, hides, skins, hair and fur, feathers, coffee and substitutes, cereals, sugar, indigo).

Summary of trade (value in francs) with France, Austria, 1840-1862; Italy, 1852-1861; German Customs Union 1851, 1862.

23. Handel der Schweiz mit dem Königreich Italien. Commerce de la Suisse avec le Royaume d'Italie.

Annual statistics of import and export (quantity) between Switzerland and Italy, 1869-1874, from Swiss documents.

Annual statistics of import and export (quantity, value) 1862-1873, from Italian documents.

29. Handel Frankreichs mit der Schweiz von 1862-1874. Commerce de la France avec la Suisse pendant les années 1862-1874.

Annual statistics according to French documents, of import and export (quantity, value) between France and Switzerland, 1862-1874, by products. Total value of exports and imports, by countries of destination and of origin.

30. Waarenverkehr über die grenze zwischen Oesterreich und der Schweiz in den jahren 1866-1874. Mouvement commercial à la frontière suisse-autrichienne pendant les années 1866-1874.

Annual statistics according to Austrian documents, of commodities passing the Swiss-Austrian frontier, 1866-1874; (value) 1874; also of transit (quantity) through Austria-Hungary over the Swiss-Austrian frontier, 1866-1874; (value) 1874.

33. Waarenverkehr über die grenze zwischen Deutschland und der Schweiz in den jahren 1872-1875. Mouvement commercial à la frontière suisse-allemande, pendant les années 1872-1875.

Annual statistics according to German documents, of import and export (quantity, value) of commodities passing the German-Swiss frontier, 1872-1875; also of transit (quantity) through Germany over the German-Swiss frontier, 1872-1875.

41. Handel der Schweiz mit dem königreich Belgien (1871-1877). Commerce de la Suisse avec le Royaume de Belgique, (1871-1877).

Annual statistics according to Belgian documents, of import and export (quantity, value) between Belgium and



Switzerland, 1871-1877. Annual statistics of import, export, and transit, by categories of commodities, 1871-1877.

42. Waarenverkehr über die grenze zwischen Deutschland und der Schweiz in den jahren 1875-1877. Mouvement commercial à la frontière suisse-allemande pendant les années 1875-1877.

Annual statistics according to German documents, of import and export (quantity, value) of commodities passing the German-Swiss frontier, 1875-1877; also of transit (quantity) through Germany over the German-Swiss frontier, 1875-1877.

Annual statistics of import and export (quantity), 1875-1878, according to Swiss documents.

43. Handel der Schweiz mit Frankreich in den jahren 1875-1877. Commerce de la Suisse avec la France pendant les années 1875 à 1877.

Annual statistics of import and export (quantity, value) between France and Switzerland, 1875-1877, according to French documents.

46. Waarenverkehr über die grenze zwischen der Schweiz und Oesterreich in den jahren 1875-1877. Mouvement commercial à la frontière suisse-autrichienne pendant les années 1875-1877.

Annual statistics, according to Austrian documents, of import and export (quantity, value) of commodities passing the Swiss-Austrian frontier, 1875-1877; also of transit (quantity) through Austria-Hungary over the Swiss-Austrian frontier, 1875-1877.

Annual statistics, according to Swiss documents, of import and export (quantity, value) of commodities passing the Swiss-Austrian frontier, 1875-1878.

48. Handel der Schweiz mit Italien in den jahren 1874-1878. Commerce de la Suisse avec l'Italie pendant les années 1874 à 1878.

Annual statistics, according to Italian documents, of import and export (quantity, value) between Switzerland and Italy, 1874-1878.

Annual statistics of import into Italy from Switzerland and from other countries of commodities of most importance to Switzerland, 1869-1879.

Livestock, Poultry. Bees. (Livr. 9, 13, 31, 37, 70, 116, 132, 152, 178, 179, 207, 213, 214, 215.)

The Department of Agriculture has nos. 116, 132, 178, (262St2Vi); 179 (262St2Bi); 207, 213 (262St2Be); 214 (262St2R); 215 (262St2Vo)

L.C. has complete set.



9. Recensement du bétail de la Suisse du 21 avril 1866.

Contains provisions of the law of July 1, 1865, providing for a livestock census to be taken at intervals of ten years, beginning with that of April 21, 1866.

Annual import and export statistics, horses, foals, mules, asses, horned cattle, calves, sheep and lambs, hogs, goats, 1860-1865.

Numbers of horses (according to age); asses and mules; cattle (bulls, cows, heifers, calves); hogs (boars, sows, suckling pigs); sheep; goats, by cantons, districts, and communes.

Numbers of horses, cattle, hogs, sheep, goats per kilometre and per 1000 inhabitants, by cantons. Comparison with statistics of Baden (1861), Bavaria (1863), Belgium (1856), France (1852), Great Britain and Ireland (1865), Hanover (1857), Hesse (1859 and 1862), Ireland (1860), Mecklenburg-Schwerin (1857), Nassau (1861), Netherlands (1860), Oldenburg (1852), Austria (1857), Prussia (1861), Saxony (1861), Sweden (1860), Württemberg (1861).

13. Statistik der viehbesitzer in der Schweiz am 21. April 1866. Statistique des propriétaires de bétail en Suisse au 21 avril 1866. French and German.

Statistics of owners of livestock, according to number owned, by cantons and districts.

31. Schweizerische viehzählung vom 21. April 1876. Erster teil. Recensement du bétail de la Suisse du 21 avril 1876. Première partie.

Numbers of horses, mules, asses, cattle, hogs, sheep, goats, beehives, by cantons, districts, and communes.

Value of horses, mules, asses, cattle, hogs, sheep, goats, beehives, by cantons.

Comparative figures showing numbers and value of livestock on April 21, 1876 and on April 21, 1866.

Annual statistics of import and export of horses, foals, mules, asses, horned cattle, calves, hogs, sheep and lambs, goats, beehives containing live bees, 1861-1875.

Annual statistics of import and export of oxen and bulls, cows, calves, by countries of origin and of destination, 1866-1874.

37. Schweizerische viehzählung vom 21. April 1876. Zweiter theil. Statistique der viehbesitzer. Recensement du bétail de la Suisse du 21 avril 1876. Deuxième partie. Statistique des propriétaires de bétail. German and French.

Classification of livestock owners according to number owned, by cantons and districts.

70. Die Schweizerische viehzählung vom 21. April 1886. Recensement du bétail de la Suisse du 21 avril 1886. German and French.



Numbers of livestock owners and of horses, mules, asses, cattle, hogs, sheep, goats, beehives, by cantons, districts, and communes.

Statistics of import and export (quantity, value, countries of origin and of destination), horses, mules, foals, asses, cattle, hogs, sheep and goats, fresh meat, salted and smoked meat, hides, skins, fresh milk, condensed milk, lard, butter, fresh and salted, cheese.

Annual statistics of import and export (numbers) of horses, foals, asses, mules, cattle, calves, hogs, goats, sheep and lambs, 1851-1886.

Annual statistics of import and export (quantity) of fresh meat, salted or smoked meat, hides and skins, fresh milk, condensed milk, butter and lard, cheese, 1877-1884.

U.S.D.A.  
262  
St2Vi

116. Die ergebnisse der eidgenössischen viehzählung vom 20. April 1896.

Owners of livestock, for whom farming is the only, the main, or a secondary occupation, and according to numbers and kinds owned, by cantons, districts, and communes.

Numbers of horses, mules, asses, cattle, hogs, sheep, goats, beehives, by cantons, districts, and communes.

U.S.D.A.  
262  
St2Vi

132. Resultats du recensement federal du betail et des ruches d'abeilles du 19 avril 1901. 2v.

U.S.D.A. has German edition: V. allgemeine schweizerische viehzählung vorgenommen am 19. April 1901.

A law of December 22, 1893 provides for a livestock census every five years.

Numbers of livestock owners, horses, mules, asses, cattle, hogs, sheep, goats, beehives, by cantons, districts, and communes.

152. Résultats du recensement fédéral du bétail du 20 avril 1906.

Numbers of livestock owners and of horses, mules, asses, cattle, hogs, sheep, and goats, by cantons, districts, and communes.

U.S.D.A.  
262  
St2Vi

178. Résultats du recensement fédéral du bétail du 21 avril 1911. U.S.D.A. has German edition: VII. allgemeine schweizerische viehzählung vorgenommen am 21. April 1911.

Numbers of livestock owners and of horses, cattle, hogs, sheep and goats by cantons, districts, and communes.

Comparison of results of census of 1866, 1876, 1886, 1896, 1901, 1906, 1911.

U.S.D.A.  
262  
St2Be

207. VIII<sup>e</sup> recensement suisse du bétail du 19 avril 1916.

U.S.D.A. entry: Switzerland. Eidgenössisches departement des Innern, statistisches bureau.

Numbers of livestock owners, horses, mules, asses, cattle, hogs, sheep, goats, by cantons, districts and communes.

Comparative figures for previous censuses, by cantons.



213. IX<sup>e</sup> recensement suisse du bétail du 19 avril 1918.

U.S.D.A.  
262  
St2Bc

U.S.D.A. entry: Switzerland. Eidgenössisches departement des innern. Statistisches bureau.

Numbers of livestock owners and of horses (less than 4 years old, more than 4 years old, for breeding, for work, for pleasure); mules; asses; cattle (calves for slaughter, for raising; young cattle from 6 months to a year old; heifers under and over 2 years; cows; bulls; oxen); hogs (boars, sows, hogs for fattening); sheep; goats (kids for slaughter, for raising; he goats; milk goats), by cantons, districts, and communes.

179. V. recensement fédéral des ruches d'abeilles exécuté le 21 avril 1911.

U.S.D.A.  
262  
St2Bi

U.S.D.A. entry: Switzerland. Eidgenössisches departement des innern. Statistisches bureau. v. allg. schweizerische zählung der bienenvölker vorgenommen am 21. April, 1911.

Numbers of owners of beehives; owners of beehives owning or not owning livestock, by cantons.

Numbers of owners of beehives, with or without agricultural enterprises, by cantons, districts, and communes.

Numbers of beehives (with fixed or movable combs or both) by cantons, districts, and communes.

Numbers of owners with 1 or 2 hives, 3 to 10 hives, 11 and more hives.

Comparative tables showing total numbers of owners and of beehives on April 21, 1876, April 21, 1886, April 20, 1896, April 19, 1901, April 21, 1911, by cantons.

214. VI. recensement fédéral des ruches d'abeilles exécuté le 19 avril 1918.

U.S.D.A.  
262  
St2R

U.S.D.A. entry: Switzerland. Eidgenössisches departement des innern. Statistisches bureau.

Numbers of owners of beehives, owners of beehives owning or not owning livestock, by cantons, districts, and communes.

Numbers of owners of beehives, with or without agricultural enterprises, by cantons, districts, and communes.

Numbers of beehives (with fixed or movable combs), by cantons, districts, and communes.

Numbers of owners with 1 or 2 hives; 3 to 10 hives, 11 and more hives.

Comparative tables showing total numbers of owners and of beehives on April 21, 1876; April 21, 1886; April 20, 1896; April 19, 1901; April 21, 1911; April 19, 1918, by cantons

215. 1<sup>er</sup> recensement fédéral des volailles exécuté le 19 avril 1918.

U.S.D.A.  
262  
St2Vo

U.S.D.A. entry: Switzerland. Eidgenössisches departement des innern. Statistisches bureau.

Numbers of poultry owners and of geese, ducks, hens, turkeys and guinea fowls, by cantons, districts, and communes.



Population, Census

1860.(Livr.1, 2, 8, 11). Livr. 11 contains statistics of occupations by cantons and districts.

1870.(Livr.15, 20, 28). Livr. 28 contains statistics of occupations.

1880.(Livr.51, 56, 59). Livr. 59 contains statistics of occupations.

1888.(Livr.84, 88, 97). Livr. 97 contains statistics of occupations.

1900.(Livr.140, 145, 151, 162). Livr. 151 contains statistics of occupations.

1910.(Livr.195, 204, 212). Livr. 212 contains statistics of occupations.

U.S.D.A.

262

St2E

and

262

St2Ei

U.S.D.A. has 1888, 1900, and 1910, Entry: Switzerland.

Eidgenössisches departement des innern. Statistisches Bureau. Die ergebnisse der eidgenössischen volkszählung...

The volumes for 1860 and 1870 are out of print.

Vital statistics not included.

L.C.

HF3708

.U5A12

Switzerland. Statistisches bureau.

Tableau comparatif de l'exportation de la Suisse pour les Etats-Unis de l'Amerique du nord. [Berne 18 - ]

Title varies.

L.C. has tables for 1875, 1880, 1881, each set of tables containing comparative figures for all previous years beginning with 1864. The commodities given include silk goods, cotton and woolen fabrics, straw and horsehair goods, cheese, and leather, and the figures represent the value of their export in francs from Switzerland to the United States.

L.C.

HF3113

.A3

Switzerland. Statistisches bureau.

Waaren-ausfuhr aus der Schweiz nach den Vereinigten Staaten von Nordamerika im jahr 1876, verglichen mit derjenigen der jahre 1864 bis und mit 1875. Nach den ... mittheilungen der Tit. Konsulate in Zürich, Basel und Genf, zusammengestellt vom Eidgen. statistischen bureau. [Bern, 1877.]

This is a broadside giving the annual value of exports of silk and silk goods, cotton and woolen fabrics, straw and horse hair goods, cheese, and leather from Switzerland to the United States, 1864-1876.

L.C.

HF3708

.U5A13

Switzerland. Statistisches bureau.

Waarenausfuhr der Schweiz nach den Vereinigten Staaten von Nordamerika. Exportation de la Suisse pour les Etats-Unis de l'Amerique du Nord. Veröffentlicht vom eidg. statistischen bureau nach den mittheilungen der Tit.

Konsulate der Vereinigten Staaten. [Bern, 18 ]

A sheet of tables giving the annual value of the export of silk and silk goods, cotton and woolen fabrics, straw and horse hair goods, cheese, and leather from Switzerland to the United States, 1864-1881.

Switzerland. Statistisches bureau. See also Switzerland. Eidgenössisches departement des innern. Statistisches bureau.

L.C.  
HC395  
.A47

Switzerland. Volkswirtschaftsdepartement. Rapports économiques de la feuille officielle suisse du commerce. 1926-1927. Berne, Imprimerie F. Pochon-Jent. [1926]-27. Monthly. \_\_\_\_\_ numero supplementaire. La marge des prix dans le commerce du lait en Suisse. Nov. 1927.

Index numbers of wholesale and retail prices, monthly, 1924-1927.

Statistics of export (quantity, value) of cheese, condensed milk, livestock, 1924, 1925. (Jan., 1926); cheese, 1925, 1926(Mar., 1927)

Area, production, bread grain (wheat, spelt, rye, maslin); other grain (barley, oats, maize), 1923-1925(Jan., 1926).

Gross return from cultivation of grain, potatoes, sugar beets, hemp and flax, tobacco, hay for horses other than those used in agriculture; fruit trees, and marsh grass, viticulture, livestock raising (cattle, horses, sheep, goats, poultry) beekeeping, sericulture, 1923, 1924, preliminary figures for 1925 (Jan., 1926); 1925, preliminary figures for 1926 (Jan., 1927).

Numbers of cows, goats; production of milk, total, per cow, per goat, 1921-1926; quantity of milk delivered, 1914-1920, monthly, 1925, 1926; consumption of milk, 1926 (Oct., 1927).

Numbers of poultry owners; numbers of hens, ducks and geese, 1918, 1921, 1926; numbers of poultry owners and of hens, by cantons. (Oct., 1927).

Monthly market prices of wheat, 1925 (May, 1926); area of wheat, 1917, 1919, 1926; by cantons, 1917, 1926 (Nov., 1926); deliveries to Government and price paid, 1917-1925 (Dec., 1926).

Monthly prices of oxen, heifers, calves, hogs, 1925 (Feb., 1926); numbers of horses, cattle, cows, hogs, sheep, goats, 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1921, 1926(Aug., 1926).

Supplément: La marge des prix dans le commerce du lait en Suisse. A study of the difference between the prices paid to producers and those paid by consumers.

Milk statistics: Production (total; per capita, per cow, per goat) 1866, 1911, 1926; consumption for livestock



raising, by livestock owners, by the rest of the population for transformation into by-products, 1866, 1911, 1926; annual consumption in litres, per family, per capita, 1912, 1919-1922; daily deliveries (total, for consumption, for transformation into by-products), June, 1925.

Price paid to producer, margin of wholesale price, margin of retail price, price paid by consumer, in Zurich, Berne, Bâle, March, 1927.

Daily demand, price of delivery to retail trade, price per litre in a number of cities, 1926/27.

Numbers of milk societies, price paid to producers, retail price, margin, 1870/79, 1880/89, 1890/99, 1900/1905, 1905/1909.

L.C.  
HC395  
.A3

Switzerland. Volkswirtschaftsdepartement. Rapports économiques et statistiques sociales, publiés par le Département fédéral de l'économie publique. Année 1928- Berne, 1929- (Supplément de la Feuille officielle suisse du commerce) Monthly. Issued also in German.

Title varies slightly.

Formed by the union of Sozialstatistische Mitteilungen ... Informations de Statistique Sociale (Arbeitsamt) and Rapports Economiques de la Feuille Officielle Suisse du Commerce.

Published also without supplement note.

Continued as "La Vie Économique," Jan., 1930- [not in L.C.]

L.C.  
HC395  
.A32  
no.1

1. Supplément. Contribution à l'étude des prix du pain en Suisse. Berne, 1928. 30p. (Preisbildungskommission. 2.Publication) Bibliography: p.29-30.

----- 3. Supplément. La marge des prix dans le commerce suisse de la boucherie et de la charcuterie. Berne, 1929. 60p. (Preisbildungskommission. 3.publication)

HC395  
.A32  
no.3.

"Supplément de la Feuille officielle suisse du commerce." Bibliography: p.60.

Contains the same statistics as the German edition.

Switzerland. Volkswirtschaftsdepartement. Wirtschaftliche und Sozialistische Mitteilungen. (LC HC393.A33), q.v.

L.C.  
HC395  
.A3  
date a

Switzerland. Volkswirtschaftsdepartement. Rapports économiques et statistiques sociales... 1929- [another issue] [Berne, 1928?-

L.C.  
HC395  
.A33

Switzerland. Volkswirtschaftsdepartement. Wirtschaftliche und sozialstatistische mitteilungen... jahrg. 1928- Bern, 1929- Monthly.

Issued also in French.

Hrsg. vom Eidgenössischen volkswirtschaftsdepartement.

Formed by the union of Sozialstatistische Mitteilungen... Informations de Statistique Sociale (Arbeitsamt) and Wirtschaftsberichte des Schweizerischen Handelsamtsblatt.

Feuille Officielle Suisse du Commerce.

L.C.  
HC395  
.A34  
nr.1. \_\_\_\_\_ Sonderheft 1. Die brotpreisverhältnisse in der Schweiz. Bern, 1928. 28p. (Preisbildungskommission. Veröffentlichung nr. 2)  
Bibliography: p.27-28.

L.C.  
HC395  
.A34  
nr.3. \_\_\_\_\_ Sonderheft 3. Die verarbeitungs- und verschleiss-spanne im fleisch- und fleischwarenverkehr der Schweiz. Bern, 1928. 60p. (Preisbildungskommission. Veröffentlichung nr. 3)  
Bibliography: p.60.

L.C.  
HC395  
.A33 \_\_\_\_\_ Sonderheft 9. Das wirtschaftsjahr 1929 mit wirtschaftszahlen bis März 1930. Bern, 1930. 55p.  
For analysis of contents, see Switzerland. Département suisse de l'économie publique. Das Wirtschaftsjahr (262.Ec7)

U.S.D.A  
262  
Ec7 \_\_\_\_\_ Average annual index numbers of cost of living, 1915-1927; monthly index numbers of cost of living, 1927 (Jan., 1928).

Monthly index numbers of retail prices (comparative figures for corresponding month of 4 preceding years) of dairy products, eggs, fats and oils, meat and meat products, bread and other grain products, sugar and honey, potatoes and legumes, coffee and chocolate.

Index numbers of cost of living, annual, 1921- monthly Jan. 1927- ; monthly by communes Dec., 1927- (Jan., 1928- )

Monthly index numbers of wholesale prices by groups of commodities; also milk, butter, eggs, cattle, hogs, lard, wheat, oats, barley, maize, potatoes, margarine, tea, coffee, beans, peas, lentils, rice, sugar, milk, cocoa beans, hops, malt, oil fruits, cotton, wool, silk, hides, wood, fodder products, hay, oil cakes, artificial fertilizer, straw (Jan., 1928- )

Monthly index numbers for food, heat and light, clothing, rent, 1921- (Jan., 1928- )

Average annual index numbers of foodstuffs, by communes, 1925-1929 (Feb., 1930).

Monthly index numbers of wholesale and retail prices of foodstuffs, Jan., 1926-Mar., 1930 (Apr., 1930); Jan., 1926-July, 1930 (Aug., 1930); Jan., 1926-Dec., 1930 (Jan., 1931).

Monthly prices in 34 communes of beef, pork, veal, lard, butter, cheese, milk, bread, white flour, sugar, potatoes, eggs, Dec., 1927- ; also average monthly price in 34 communities of above commodities.

Monthly statistics of import and export (value) by categories of commodities, 1927- (Feb., 1928- )

Area, production of grain (wheat, spelt, rye, maslin, barley, oats, maize, 1926, 1927 (Jan., 1928); + maize, 1928, 1929 (Dec., 1929)

Freight rates for cherries, apples, pears, 1926, 1927 (Jan., 1928); 1928, 1929 (Dec., 1929)



Gross return from various agricultural activities (grain cultivation, tobacco cultivation, livestock raising, viticulture, horticulture, etc.) 1927- (comparative figures for 2 preceding years) (January of each year)

Total grain production; quantity delivered to the Government; quantity used at home; quantity imported; total grain requirement, 1926-1928 (June, 1929)

Numbers of livestock slaughtered: monthly and amount of meat produced in 1927 (Feb., 1928); Jan.-Sept. 1927, 1928 (Dec., 1928); bulls, oxen, cows, calves, sheep, goats, hogs, horses, yearly figures, 1927- (Feb. of each year); quarterly figures, May, Aug., Nov., (1929- ).

Southern fruits, quantity imported, total, per capita, 1877, 1887, 1897, 1907, 1913, 1927; total quantity imported and value, lemons and oranges, dates and figs, almonds and nuts, bananas and pineapples, 1911-1927 (April, 1928)

Tobacco, consumption, total, per capita, average per decade, 1851-1920; 1921/27; annual statistics of import and export 1851-1927 (May, 1928); consumption, import, export, 1924-1927 (July, 1928).

Eggs, statistics of production and consumption. Monthly import statistics, 1924-1927. Monthly retail and wholesale prices, 1921-1927 (May, 1928).

Milk, production, 1921-1927; utilization and consumption, 1926, 1927 (May, 1928).

Coffee, consumption, total per capita, by decades, 1851-1920; 1921/28; total, 1911-1920 (June, 1928).

Tea, import statistics, by four-year periods, 1851-1925; 1926/27 (Sept., 1928)

Beer, production, 1890, 1911, 1923, 1928 (Apr., 1929); total and per capita production, total by cantons, 1929; total, 1891, 1901, 1911, 1920, 1923, 1929 (Feb. 1930); total and per capita production, total by cantons, 1930; total, 1891, 1901, 1911, 1920, 1923, 1930 (Feb., 1931).

Sugar, import, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910-1929 (Nov., 1929).

Meat, consumption (total, per capita), 1913-1930; total consumption (bulls, oxen, cows, hogs, sheep, goats, horses, frozen meat, poultry) 1930.

L.C.  
HC395  
.A46  
1925

Switzerland. Volkswirtschaftsdepartement. Wirtschaftsberichte des schweizerischen handelsamtsblattes. Rapports économiques de la feuille officielle suisse du commerce, 1925. Berne, Buchdruckerei F. Pochon Jent, 1925. 360p. Weekly.

German and French text. Each number has, in addition to the German and French title, an Italian title: Rapporti economici del foglio ufficiale svizzero di commercio.

Most numbers include "Literatur."

Continued in 1926 by separate German and French editions.  
Index numbers, cost of living, 1921-1924; wholesale prices,  
monthly, 1921-1925.

Meat, consumption, total, per capita, of Swiss origin, of  
foreign origin, import, 1913-1923.

Index numbers, retail prices, dairy products, eggs, fats,  
meat, bread and cereals, sugar and honey, etc., potatoes  
and legumes, monthly, 1923-1925.

Number of people employed in agriculture, percentage of  
population, by cantons, 1860, 1920.

Gross return from various types of agricultural activity  
(grain cultivation, potato cultivation, horticulture, live-  
stock raising, etc.), 1913, 1922-1924.

L.C.  
HC395  
.A48  
1927  
Switzerland. Volkswirtschaftsdepartement. Wirtschaftsberichte  
des schweizerischen handelsamtsblattes. 1926-1927. [Bern,  
1926-27]. Published 2 or 3 times a month.

Issued also in French.

(t.-p. for 1926 and no. 17, 1926, wanting in L.C. copy.)

Continuation of Wirtschaftsberichte des Schweizerischen  
Handelsamtsblattes. Rapports Économiques de la Feuille  
Officielle Suisse du Commerce. 1925.

United in January, 1928, with Sozialstatistische  
Mitteilungen... Informations de Statistique Sociale, 1923-  
1927 (Arbeitsamt) to form Wirtschaftliche und Sozialstatistische  
Mitteilungen.

L.C.  
HC395  
.A34  
[Sonderheft] Die Verschleisspanne [!] im  
Milchhandel der Schweiz. [Bern, 1927]

(Preisbildungskommission. Veröffentlichung, nr. 1)

Bibliography: p.39.

Contains substantially the same statistics as Rapports  
Économiques de la Feuille Officielle Suisse du Commerce,  
published monthly (HC395.A47)

Switzerland. Volkswirtschaftsdepartement. See also Switzerland.  
Departement suisse de l'économie publique.

U.S.D.A. Switzerland. Zolldepartement. Monatsstatistik des auswärtigen  
262 handels der Schweiz... Statistique mensuelle du commerce  
Z7Sc extérieur de la Suisse. [Bern, 1855 - ]

Hrsg. vom Schweizerischen zolldepartement

Hrsg. vom Eidgenössischen zolldepartement, 1921-1923.

Hrsg. vom Eidgenössischen oberzolldirektion 1924-

L.C.  
HF223  
.A17  
Title varies: 1885-1892, Waarenverkehr der Schweiz mit  
dem Auslande. Uebersicht der ein-und ausfuhr der wichtigsten  
Warenartikel...



1893(1-3 quartel) Schweizerische handelsstatistik. Ein- und ausfuhr der wichtigsten Waren.  
1893(4. quartel)-1922, Schweizerische handelsstatistik. Ein-und ausfuhr der wichtigsten Waren...  
1923-24. Statistik des auswärtigen handels der Schweiz...  
Statistique du commerce exterieur de la Suisse.

Published monthly Jan. 1925-

U.S.D.A has 1919- (lacks 1919, 2. trim.-1920

L.C. has 1885-

L.C. entry: Switzerland. Finanz-und zolldepartement. Schweizerische handelsstatistik. Ein-und ausfuhr der wichtigsten waren. Statistique du commerce de la Suisse.

Statistics of import and export, by commodities, (quantity, value, country of origin and of destination). Monthly and quarterly figures are provisional; final figures in annual report. Each volume contains a summary of Switzerland's foreign trade according to categories of commodities. From January 1, 1924- the Swiss Customs Union includes the Principality of Liechtenstein (Treaty of Mar. 29, 1923. Ratified by Swiss Federal decree of Dec. 21, 1923).

U.S.D.A. Switzerland. Zolldepartement. Statistik des warenverkehrs der  
262 Schweiz mit dem Auslande. Statistique du commerce de la  
Z7S Suisse avec l'etranger.

Yearly 1885-

L.C. 1923- in two parts. Issued by Eidgenössische  
HF223 Oberzolldirektion.

.A2 U.S.D.A. has 1885-

L.C. has 1885-

L.C. entry: Finanz-und Zolldepartement.

Yearly statistics of import, export, transit trade, customs receipts (quantity, value, countries of origin and of destination). Special tables for commerce with foreign countries, by commodities.

U.S.D.A. Switzerland. Zolldepartement. Statistique du commerce suisse.  
262 Rapport annuel ... [Bern, 1885- ]

D85R Hrsg. von schweiz. Zolldepartement, 1885-1886, 1888, 1892, 1897.  
Publié par le Département fédéral des péages, 1885-1889.

L.C. Publié par le Département fédéral des douanes, 1890-1922.

HF223 Publié par la Direction générale des douanes fédérales, 1923-  
.A25 Title-page and tables in German and French, 1885-1886, 1888.

Title varies: 1885 Schweizerische handelsstatistik.

Tabèlle des einheitswerthe pro 1885 nebst angabe der ausfuhr- mittelwerthe von Deutschland, Frankreich und Italien pro 1884.

1889-1890 Statistique du commerce de la Suisse. Rapport annuel et tableau des valeurs moyennes...

1892-1893, Statistique du commerce de la Suisse, Rapport annuel...

U.S.D.A. has German ed. of 1892; L. C. has German ed. of 1897, both with title Schweizerische handelsstatistik. Jahresbericht.

\_\_\_\_\_ ... Beilage zum jahresbericht 1901... Specialhandel mit den einzelnen ländern in den jahren 1892-1901. Commerce special avec les divers pays pendant les années 1892-1901. Bern, Buchdr. A. Benteli, 1902, 215p.

U.S.D.A. has 1885- (lacks 1837; 1891; Has only German ed., 1892)

L. C. has 1885-

L.C. entry: Switzerland. Finanz-und Zolldepartement. Statistique du commerce suisse. Rapport annuel.

Annual review of the trade of Switzerland with foreign countries along general lines.

... Beilage zum jahresbericht 1901... Specialhandel mit den einzelnen ländern in den jahren 1892-1901. Commerce special avec les divers pays pendant les années 1892-1901. Bern, Buchdr. A. Benteli, 1902. 215p. Bound with Statistique du commerce suisse. Rapport annuel 1901. Also as a separate (HF3701.A3 1902).

Annual statistics of import and export (value), 1892-1901. By countries.

Switzerland. Zolldepartement. See also Switzerland. Finanz-und zolldepartement.

U.S.D.A. 17 Se2 Union suisse des paysans. Publications no. 1-99. Brougg, 1900-1930..

The following numbers contain agricultural statistics:

No. 31 - La question ouvriere agricole en Suisse. 1. partie: La condition des ouvriers agricoles suisses autrefois et aujourd'hui. 1908.

Statistics of agricultural population, 1888, 1900: working on own farm, male, female; working on farm of a member of the family, male workers, female workers; belonging to technical personnel, male, female; farm servants, male, female; day workers, male, female; working in an indeterminate capacity, male, female; employed in the household, members of family, servants, male, female; non-productive members of family.

Numbers of farm servants, male, female, by cantons, 1888, 1900; numbers of day workers; house servants, female; independent farmers; those working on the farm of a relative, male, female; female members of family employed in the household.

Numbers of farm servants, day workers, less than 15 years old, between the ages of 15 and 19, 20 and 24, 25 and 29, 30 and 39, 40 and 49, 50 and 59, 60 and 69, 70 and 79, 80 years old and over.

Statistics showing dearth of agricultural labor, by cantons; in winter; among family members; by categories of workers.



Wages of cowherds showing increases in periods from 1800/49-1850/69; 1850/69-1870/79; 1870/79-1880/89; 1880/89-1890/99; 1890/99-1906.

Weekly wages of cowherds; stable hands; farm servants, male, female, by cantons, 1800/49; 1850/69; 1870/79; 1880/89; 1890/99; 1906.

Wages of day workers (with board and lodging), male; summer, winter, by cantons, 1800/49; 1850/69; 1870/79; 1880/89; 1890/99; 1906; female, summer, winter, 1906.

Wages of day workers (without board and lodging), male, female, summer, winter, by cantons, 1906.

Cost per day's upkeep for a man, by cantons. Number of times per week meat is provided for dinner or supper, by cantons.

Lunch provided at 10 and 4, in summer only, all the year round, not at all, by cantons. Cheese, lard, sausage provided in addition to bread, all the year round, when work is heavy, not at all, by cantons.

Improvement in lunches and other meals, by cantons.

Wages for piece work, by cantons:

- 1) ploughing; ploughing and harrowing; weeding.
- 2) mowing grass, per hectare, by hand, by machine; mowing and haymaking per hectare; mowing, haymaking and housing in barns, per hectare.
- 3) cutting and sawing wood; making into bundles.
- 4) working in vineyards.

Expenditure for agricultural wages, 1888, 1900: payment in kind, board, lodging.

Employment of seasonal workers, by cantons.

Appendix contains table of average, maximum, and minimum wages in 1906, by cantons and districts, of cowherds; stable hands; farm servants, male, female; day workers, male, female, with and without board, summer, winter.

No. 40 - La question ouvrière agricole en Suisse. 2. partie: Questions générales. L'amélioration des conditions du travail agricole. Le service de placement. 1911.

Average length of working day for men; hour at which work begins in the morning; length of time allowed for meals and for rest; hour at which work stops in the evening (spring, haymaking, summer, autumn, winter), by cantons.

Numbers of hours of work on Sunday, by cantons.

Number of holidays, by cantons.

Conditions of agricultural labor and suggestions for their improvement are discussed, as well as problems of insurance, wage contracts, and loans, social welfare measures, and plans for the organization of employment bureaus.

no. 44 - Erhebungen über den stand des landwirtschaftlichen vereins-und genossenschaftswesens in der Schweiz am 1. januar 1910. 1912.

Statistics of membership, date of foundation and main aims of agricultural cooperative associations.

No. 45 - Die landwirtschaftliche arbeiterfrage in der Schweiz. 3. Teil: Vorschläge zur Lösung des problems (Fortsetzung). Die vermehrung des angebots landwirtschaftlicher arbeitskräfte. 1912.

A study of measures to increase the supply of agricultural labor and of the employment of foreign seasonal labor.

No. 54 - La question ouvrière agricole en Suisse. 4. partie: Propositions en vue de la solution du problème. (Fin.) La reduction des besoins de la main-d'oeuvre agricole. 1917.

A study of measures to decrease the need of agricultural labor, including the mechanization of agriculture.

No. 68 - Enquête sur les associations agricoles de la Suisse en 1920.. 1923.

Statistics of membership in 1920, date of foundation, and main aims of agricultural cooperative associations.

No. 70 - Les salaires agricoles en Suisse. Enquête de 1921. 1923.

Average weekly wages of foremen of laborers, by cantons, before the war; 1921.

Average weekly wages of cowherds, by cantons, 1906; before the war; 1921; increases in weekly salary during the periods from 1800/49 to 1850/69; 1850/69-1870/79; 1870/79-1880/89; 1880/89-1890/99; 1890/99-1906; 1906-1913/14; 1913/14-1920/21.

Average weekly wages of carters; farm servants; domestic and farm servants (female), 1906; before the war; 1921.

Average weekly wages of young boys just out of school; inexperienced probationers; probationers who have attended schools of agriculture and who are sons of farmers; probationers who have attended schools of agriculture and whose fathers are not farmers, by cantons, before the war; 1921.

Average wages of workers by the day (without meals; with lunch at 10 and 4; with full board), male, female, summer, winter, by cantons, before the war; 1921.

Average annual wages of managers, single, married with wife acting as housekeeper or with wife working regularly in the fields, by cantons, before the war; 1921; assistant managers or foremen, by cantons, before the war; 1921.

Wages for piece work, before and after the war:

- 1) ploughing; ploughing and harrowing.
- 2) hoeing potatoes, by hand, by horse power.
- 3) hilling up potatoes, by hand, by plough.
- 4) sowing grain; spreading manure; mowing marsh grass.
- 5) mowing grass, by scythe, by mowing machine.
- 6) mowing and haymaking; mowing, haymaking and housing in barns; mowing and haymaking per qn. of hay.
- 7) grafting fruit trees.



- 8) work in vineyards.
- 9) cutting and sawing wood; making into bundles.
- 10) cost of horse shoeing, per shoe, new shoes, shoes already used.
- 11) cost of castration of hogs; paring hoofs of cattle.
- 12) veterinary's fees, at his home, on the farm.
- 13) doctor's fees, at his home, on the farm.

An appendix contains a table giving weekly wages (maximum, minimum, average) in addition to board and lodging, of foremen, cowherds, carters, farm servants (male, female), boys just out of school, by cantons and districts, before the war; after the war; daily wages (maximum, minimum, average) of day laborers (male, female), with and without board, summer, winter, by districts, before the war; after the war.

No. 74 - Enquête sur la situation de la viticulture en Suisse. 1924.

Area in vines, 1898, 1921, by cantons; average value of vineyards, 1906/22; cost of production (itemized) 1906/13; 1914/17; 1918-1922; average cost of production per hectare, 1906/22; 1922; cost of production of one hectolitre of wine, 1906/13; 1914/17; 1918-1922.

Production of wine in hl. per hectare, 1906/13; 1914/17; 1918-1922.

Prices of wine per hl. (white wine, red wine), 1914-1922; average 1914/22.

Gross return from wine and grapes in francs per hectare, 1906/13; 1914-1922; 1906/22.

Gross return by vineyards, 1906/13; 1914/17; 1918-1922; 1906/22.

Gross return from wine and grapes in francs per hectare (corrected figures), 1906/13; 1914/17; 1918-1922; 1906/22.

Area of vineyards; gross return, total and per hectare, 1906/13; 1914/17; 1918-1922; 1906/22.

Net return in francs per hectare, 1906/13; 1914/17; 1918-1922; 1906/22.

Cost of production, price of wine per hl., 1906/13; 1914/17; 1918-1922; 1906/22.

No. 81 - L'utilisation coopérative du lait en Suisse. Résultats de l'enquête faite en 1924 . 1925.

Total area, agricultural area, number of agricultural enterprises, associations for the utilization of milk, membership of these associations, by cantons.

Number of cows, annual production of milk per cow, number of goats, annual production of milk per goat, total milk production, milk used for livestock, consumption, quantity of milk transformed into by-products, 1866, 1876, 1896, 1911, 1916, yearly 1918-1921.

Cheese, production, consumption, export, 1866, 1896, 1911, 1920, 1921.

Export of cheese, butter, 1851, 1861, 1871; cheese, butter,

condensed milk, powdered milk, 1881, 1891, 1892/1905, 1906/12, 1913, 1914/19, 1920/21.

Value of milk production, 1866, 1876, 1886, 1896, 1906, 1911, 1916, 1921.

Numbers of associations and of purchasers of milk, by cantons.

Milk delivered for all purposes, winter of 1922/23; average quantity delivered per association.

Consumption of milk by agricultural population, daily per capita, yearly per capita, 1914/19, 1920-1923.

Consumption of milk by urban population. Number of families, number of individuals per family, annual consumption of milk and cream per family, annual consumption of milk and cream per capita, 1919, 1920, 1921, 1922.

Annual per capita consumption of milk in Zurich, Bâle, Berne, other cities and districts, 1920, 1921, 1922.

Quantity of milk sold directly by producer to consumer.

Quantity of milk used for raising livestock.

Consumption of milk in Alpine regions: consumption by agricultural population, consumption by non-agricultural population, consumption by calves, milk delivered to cheese factories, consumption by hotels.

Cheese: number of cheese factories, quantity of milk used, winter of 1922/23, summer of 1923, by cantons; number of enterprises for the manufacture of cheese or butter, milk used, winter of 1922/23, summer of 1923, year 1922/23, by cantons.

Local sale of milk to consumers, total, by associations, winter of 1922/23, summer of 1923, year 1922/23, by cantons.

Milk sold for condensation; number of associations selling it, winter of 1922/23, summer of 1923, year 1922/23, by cantons.

Milk used for cheese production, for butter and cheese production, for consumption, for condensing, for other purposes, 1922/23, by cantons.

Milk, consumption, used for stock raising, made into by-products, 1896, 1911, 1922/23.

Transportation of milk, by railway, by automobile or wagon, winter, summer, per day, by cantons.

Milk consumption in a number of cities, 1922, 1923.

Average price per 100 kg., total value in francs of milk used for making cheese and butter, condensed milk, milk consumed, winter of 1922/23, summer of 1923; total value of milk production.

Value of milk cows, stables, buildings for reception and transformation of milk, means of transportation, dairy equipment in cities, industrial equipment for cheese making, etc.

Number of people employed by milk industry, 1920.

Consumption of milk and dairy products, by professions, by amount of income, by regions; consumption of cheese, by



amount of income.

Daily per capita consumption of milk in a number of cities, 1913, compared with that of some German cities.

Consumption per family of milk, butter, cheese in 1912 in Switzerland, in 1909 in Germany, in 1912 in Austria, in 1904 in England.

Proportion of family income used for milk and cream, butter, cheese, 1920, 1921.

Annual per capita consumption of milk, by size of farms, 1921, 1922, 1923, 1903/23; by types of farming operations, 1920, 1921, 1922, 1923.

Annual per capita consumption of milk according to number of children in family, 1921, 1922, 1923.

Average production, consumption of food products, 1920/22.

Statistics of import and export (quantity, value), milk; condensed milk; butter, fresh; cream; cheese of various kinds, 1923.

Summary of milk statistics by cantons and communes.

Nos. 84, 87 - L'imposition de la propriété et du revenu de l'agriculture et des organisations agricoles par la Confédération, les cantons et les communes. 1. partie, 1927; 2. partie, 1928.

A study of valuation and taxation of agricultural property and income and of agricultural organizations by State, cantons, and communes.

No. 90 - L'organisation de la mise en valeur du bétail de boucherie à l'étranger et en Suisse. 1928.

Numbers of horses, cattle, hogs, sheep, goats, 1866, 1911, 1921, 1926.

Numbers of calves less than 6 months old (for raising, for fattening), young cattle between six months and a year, heifers from 1 to 2 years old, heifers more than 2 years old, cows, bulls from 1 to 2 years old, bulls more than 2 years old, oxen from 1 to 2 years old, oxen more than 2 years old, 1886, 1911, 1921, preliminary figures for 1926.

Cattle slaughtered and quantity of meat produced, calves, young cattle between six months and a year, heifers, bulls, oxen, cows, 1886, 1911, 1921, 1926.

Numbers of boars, sows, pigs less than 6 months old, pigs more than six months old, 1921, 1926.

Hogs slaughtered and quantity of meat produced, 1926.

Number of sheep, goats; numbers slaughtered and quantity of meat produced, 1926.

Numbers of livestock slaughtered and meat produced, cattle, hogs, sheep, goats, horses, 1926.

Numbers of livestock owners in relation to their chief occupation and to the numbers owned.

Returns from sale of livestock.



Production of livestock for slaughter, live weight in kg. per hectare and by size of farming enterprise, cattle, calves, hogs, 1925.

Consumption of meat in urban households, beef, pork, veal, mutton, 1919-1922.

Consumption of meat in Zurich, Bâle, Berne, other cities, beef, veal, pork, mutton, horse meat, entrails; according to occupation (officials, skilled and non-skilled workers); according to income.

Average annual price paid for beef, veal, pork, mutton, horse meat, entrails, according to occupation.

Consumption of meat on farms, purchased, produced on the farm, total, per capita and per year, 1906/13, 1914/19, 1920/22, 1923-1925.

Consumption of meat in Switzerland, total, per capita, beef, pork, mutton, goats' meat, 1911, 1921, 1926.

Consumption of animal fat, vegetable fat, edible oils, butter, 1912, 1919-1922; by cities, 1922.

Statistics of import of oxen, bulls, cows, heifers, calves, hogs, sheep, veal, pork, other fresh meat, ham, salted and smoked meat, frozen meat, preserved meat, game and poultry; export of oxen, bulls, cows, calves, veal, other fresh meat, 1906/13, 1911, 1921, 1926, 1927.

Livestock slaughtered and meat produced in Bâle, 1912, 1926.

Annual per capita consumption of meat in Bâle, 1912-1926.

Monthly prices of oxen, cows, per 100 kg. live weight, 1912, 1913. Monthly arrivals of large cattle at fairs, numbers slaughtered (bulls, oxen, cows, heifers), 1926.

Monthly arrivals, slaughter, prices per kg., calves, young pigs, 1926.

Price of hides and skins (cows, heifers, oxen, bulls, calves) at Zurich, November 7, 1927.

Statistics of cost of production of meat and of selling prices by butchers.

no. 92.- Recherches sur les conditions économiques de quelques branches de la petite exploitation. Apiculture-Agriculture-Viticulture. 1929.

1. Beekeeping:

Capital invested and receipts (itemized)  
1927, 1912/27.

Receipts from honey, average sales price, per kg., 1912/17, 1918, 1919/21, 1922, 1923/24, 1925-1927.

Expenditures (itemized), 1927, 1912/27.

Production of honey, 1912-1927; average 1920-1927.

Honey sold, used for home consumption, 1912/17, 1918, 1919/21, 1922, 1923/24, 1925-1927.

Time devoted to beekeeping, by colony and by year, in hours and minutes, 1912-1919.

Cost of production (itemized), 1927, 1912/27.



Annual cost of production 1912-1922.

Cost of production of honey, total, per kg., 1912/13, 1914/19, 1920-1927.

Gross return, honey, bee colonies and queen bees, etc., wax and combs, total, 1912/13, 1914/19, 1920-1927.

Net return, by enterprises, by colonies, per 100 fr. of cost of production, 1912/13, 1914/19, 1920-1927.

Income, 1912/13, 1914/19, 1920-1927.

Return for labor of beekeeper, 1912/13, 1914/19, 1920-1927.

## 2. Poultry Raising:

Capital invested (itemized), 1924/27.

Average production of eggs, 1924-1927.

Numbers of hens, chickens, roosters, turkeys, geese, ducks, 1924/27.

Cost of production (itemized), 1924/27; per laying hen, 1924-1927.

Cost of production of eggs, 1924-1927.

Gross return from eggs, poultry, total, 1924/27; total, 1924-1927.

Income of poultry raiser, 1924-1927; return for his labor, 1924-1927.

## 3. Viticulture:

Area of vines, by cantons, 1898, 1927.

Value of vineyards, 1906/13, 1914/19, 1920/27, 1906/27.

Cost of production (itemized) per hectare, 1906/13, 1914/19, 1920/22, 1923/27, 1906/27.

Cost of production per hl. of wine, 1924-1927.

Production of wine in hl. per hectare, 1906/13, 1914/19, 1920/22, 1923/27, 1906/27.

Average price per hl. of white wine, red wine, 1914/19, 1920/22, 1923-1927, 1923/27, 1914/27.

Gross return in money from wine and grapes in francs, per hectare, 1906/13, 1914/19, 1920/22, 1923-1927, 1923/27, 1906/27; total 1906/13, 1914/19, 1920/22, 1923/27, 1906/27.

Net return per hectare, 1906/13, 1914/19, 1920/22, 1923-1927, 1923/27, 1906/27.

Income and labor return per hectare, labor return per hour, 1906/13, 1914/19, 1920/22, 1923/27, 1906/27.

no. 95: - L'extension de la culture des céréales en Suisse. 1929.

Area, wheat (winter, summer), rye (winter, summer) spelt, maslin, barley, oats, maize, 1917, 1919, 1926.

Average farm area, 1905; area in grain, 1919, 1926; its percentage of total productive area, 1926; increased area in 1918; increase proposed in 1929, total and per livestock owner, by cantons and communes.

no. 98 - Les salaires et les conditions du travail dans l'agriculture suisse. Enquête de 1929/30. 1930.

### I. Wages

Average weekly wages of foremen of laborers, by cantons, before the war; 1921; married, unmarried, 1930.

Average weekly wages of cowherds, by cantons, before the war; 1921; married, unmarried, 1930; weekly wage and amount of increase 1850/69; 1870/79; 1880/89; 1890/99; 1900/06; 1906-1913/14; 1913/14-1921; 1921/30.

Average weekly wages of carters; farm servants; domestic and farm servants (female); probationary helpers (female); young boys just out of school; inexperienced probationers; sons of farmers without professional training; probationers who have attended schools of agriculture and who are sons of farmers; probationers who have attended schools of agriculture and whose fathers are not farmers, by cantons, before the war; 1921; 1930.

Wages of shepherds on Alpine pasturages, per head of cattle, per month, per canton, 1930; value of payment in kind, per month, 1930.

Average wages of workers by the day (without meals), male, female, summer, winter, by cantons, 1921; 1930.

Average wages of workers by the day (lunch at 10 and 4), male, female, summer, winter, by cantons, 1921; 1930.

Average wages of workers by the day (with full board), male, female, summer, winter, by cantons, 1921; 1930.

Annual value of payments in kind made to farm servants, married, unmarried, by cantons.

Average annual wages of managers (with board and lodging), single, married with wife acting as housekeeper, or with wife working regularly in the fields, by cantons, 1921; 1930; assistant managers or foremen, single, married, by cantons, 1921; 1930.

Average household expenditure per day's upkeep for one man, by size of enterprises, yearly 1924-1928; annual expenditure for upkeep of a farm servant (male, female) yearly 1924-1929.

Total remuneration for foremen (exclusive of wife's wages), cowherds (married, unmarried), carters, farm servants, sons of farmers without professional training, including wages, board, lodgings, other perquisites.

Wages for piece work:

1) carters with cart and 2 horses, per day, per hour, by cantons, 1930.

2) ploughing; ploughing and harrowing, per hectare, by cantons, 1921; 1930.

3) hoeing potatoes, per hectare by hand, by horse power, 1921; 1930.



- 4) hilling up potatoes; per hectare, by hand, by plough, 1921; 1930.
- 5) sowing grain; spreading manure; mowing marsh grass, per hectare, 1921; 1930.
- 6) mowing grass, per hectare, by scythe, by mowing-machine, 1921; 1930.
- 7) mowing, haymaking, and housing in barns, per hectare, mowing and haymaking per qm. of hay, by cantons, 1921; 1930.
- 8) grafting and treating fruit trees.
- 9) work in vineyards, 1921; 1930.
- 10) cutting and sawing wood; making into bundles, 1921; 1930.
- 11) cost of horse shoeing, per shoe, new shoes, shoes already used, 1921; 1930.
- 12) cost of castration of hogs; paring hoofs of cattle, 1921; 1930.
- 13) veterinary's fee, at his home, on the farm, 1921; 1930.
- 14) doctor's fees, at his home, on the farm, 1921; 1930.

## II. Condition of Labor

- 1) Hour at which work begins in the morning for stable workers, other male employes, spring, haymaking, summer, autumn, winter<sup>1</sup>, by cantons.
- 2) Hour at which work stops in the evening for stable employes, other male employes, spring, haymaking, summer, autumn, winter, by cantons.
- 3) Time for meals, for same categories at same periods.
- 4) Length of midday rest, for same categories, at same periods.
- 5) Average length of working day, for same categories, at same periods.
- 6) Numbers of hours of Sunday work, for same categories, at same periods; numbers of holidays for stable employes; others.

Time of payment of wages; length of time during which wages are continued in case of absence; rate of payment for extra work, by cantons.

Length of time during which wages are paid in case of illness or absence on military duty.

Proportion of farm servants insured against illness.

In a chapter on measures for increasing the supply of agricultural labor, statistics are given showing the modifications in the supply according to the censuses of 1888, 1900, 1910, 1920. These statistics include the total number of people attached to agriculture; number of

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<sup>1</sup>/ Spring, Mar.1-May 31; Haymaking, June 1-15; Summer, June 15-Aug.31; Autumn, Sept.1-Nov.30; Winter, Dec.1-Feb.28.

people for whom agriculture is a profession; independent farmers; members of family working on farm (male, female); technical and administrative employes; servants and day workers (male, female); members of the household not economically active; members of the family employed in the household; adults dependent on the workers (children, employes in the household.)

no.99 - La Viticulture suisse et l'amélioration de la vente de ses produits. 1930.

Statistics of area planted in vines, 1877, 1894, 1905, 1911, 1921, 1928, 1929; by cantons, 1877, 1894, 1928.

Annual statistics of production, value (total, per hl.) of wine (red, white), 1922-1929.

Average price per liter of wines, by cantons, 1927-1929.

Retail price of must paid to producers, by cantons.

Cost of production of grapes per hectare 1923/28; 1928, 1929; total.

Cost of production per 14,000 hectares of vines, 1923/28; 1928; 1929.

Statistics of import of vines and table grapes (quantity, value) 1892/1905; 1906/12; 1913; 1914/19; yearly 1920-1929.

Federal and cantonal subsidies in the interests of viticulture.

U.S.D.A. Union suisse des paysans.

17 Recherches relatives à la rentabilité de l'agriculture.

Un3 Rapport du Secrétariat des paysans suisses au Département fédéral de l'économie publique. 1908/9- Berne, 1910-

L.C. On cover: Tirage à part de l'Annuaire Agricole de la Suisse 1909/10-

HD2031 .A4 1908/9-1912/13, Rapport... au Département Fédéral de l'Agriculture.

and HD2031 1913/14-1917/18, Rapport... au Département Suisse de l'Économie Publique.

.A45 1918/20- Rapport... au Département Fédéral de l'Économie Publique.

1918/20- Issued in 2 parts.

U.S.D.A. has 1908/9- (lacks, 1918/19-1919/20 pt.1, for which see Annuaire Agricole de la Suisse, 1921, fasc. 5). 1908/9 in German edition only; 1926/27 part 2 in both French and German editions.

L.C. entry for French edition: Schweizerisches bauernsekretariat... ; German edition: Switzerland. Volkswirtschaftsdepartement. Untersuchungen betreffend die rentabilität des schweizerischen landwirtschaft. Bericht des schweizerischen bauernsekretariats an das schweizerische volkswirtschafts-department.

L.C. has 1913/14, French edition; 1915/16, German edition.



Brief summary of weather conditions during the year covered. Table showing hours of sunshine at a number of weather stations, 1926-

Report of the Swiss hail insurance society showing damage done by hail and amount of indemnities paid. Comparative figures for 5 or 6 preceding years. Average indemnity paid on a value of 100 francs for periods covering 1883/1890 and subsequent 9 year periods.

Annual statistics of area and production of wheat, spelt, rye, maslin, barley, oats, maize (corn), 1908-1910; production only 1911- Comparative figures for a varying number of years in each report.

Annual statistics of production of potatoes 1910- apples, pears, cherries, prunes, nuts, 1913; 1914/19; 1920/24; 1925; 1926(1926/27); 1913; 1914/19; 1920/24; 1926; 1927(1927/28)

Monthly statistics of milk deliveries to distributing centres and cheese factories 1909- (1910/11- ); annual statistics of milk production 1916- (1922/23- )

Statistics of livestock diseases, average for 5 year periods 1886/89-1900/5 and annually 1905- (1908/9- ).

Statistics of export(value only) and import (quantity, value) of agricultural products, 1885/88; 1889/91; 1892/1905; annually 1906- (1908/9- ); also tables giving the value of imported products in competition with domestic products; those of assistance to agriculture, as machinery, fertilizer, etc.

Index numbers of agricultural products, 1885/88; 1889/91; 1892/1905; annually 1906- (1908/9- ).

Average rate of interest on loans on landed property made by various banks, 1897/99; 1900/5, annually 1906- and averages for subsequent 5 year periods. (1908/9- )

A study of the profitability of Swiss agriculture, based on the accounts of a varying number of agricultural enterprises. For an account of the principles on which the following statistics are based, see the report for the period 1925/26, pt. 1, p.120-127 and pt. 2, p.417-424. Beginning with the report covering the two-year period 1918-1920, two parts are issued. Part one includes statistics of general interest which ought to be put at the disposal of the public as quickly as possible. These include cost of production, gross and net returns, labor returns, etc. Part two contains studies relative to the utilization of the soil and a series of special investigations.

Average annual receipts per enterprise and per hectare 1901- (1908/9-1917/18; 1918/20, pt.2- ); receipts from special sources, (eg. grain, potatoes, vines, cattle, hogs, goats, poultry) 1901/5; annually 1907-



Running expenses per hectare, without forests, by size of farm; for various items (e.g. salaries, fertilizer, seed, improvements, taxes, insurance) 1906- (1908/9-1917/18; 1918/20 pt.2- ).

Expenditure for purchase of concentrated fodder per hectare, by size of farm, 1901-1914 (1912/13-1914/15).

Expenditure for purchase of livestock per hectare, without forests, by size of farm (cattle without calves; calves for fattening; horses; hogs; goats; sheep; bees; other animals), 1913/15- (1915/16-1917/18; 1918/20 pt.2- ).

Amount of taxes per agricultural enterprise; total revenue from the enterprise; percentage relation of tax to revenue, annually and for five-year periods, 1901- (1908/9-1917/18; 1918/20 pt.2- ).

Household expenditures per day's maintenance, by size of farm, with and without hired labor; amount spent for food; wages; interest; rent; total expenditure 1901- (1908/9-1917/18; 1918/20 pt.2- ).

Daily consumption of milk per man; per capita 1903- (1908/9-1917/18; 1918/20 pt.2- ).

Annual consumption of milk per man; per capita 1903- (1911/12-1917/18; 1918/20 pt.2- ).

Annual consumption of alcoholic liquor per man 1906- (1908/9-1917/18; 1918/20 pt.2- )

Annual consumption of potatoes, meat per farm; per day per man; per year per man, by size of farms 1906- (1908/9-1917/18; 1918/20 pt.2- ).

Gross return: livestock raising, per hectare with and without forests; per 100 francs of capital invested; by size of enterprise; by kind of livestock raised and by size of enterprise 1901- (1908/9-1917/18; 1918/20 pt.2- ); fruit trees, per hectare, with and without forests; per 100 francs of capital invested; by size of enterprise, 1905- ; forests, as above, 1904- (1908/9-1917/18; 1918/20 pt.2- ).

#### Revenue and Expenditure

A. Revenue, total from agricultural enterprise, per hectare, per working day, 1901-1915 (1908/9-1915/16); total from agricultural enterprise, from other sources, from housekeeping, from labor and capital 1916- (1916/17-1917/18; 1918/20 pt.2- ).

B. Expenditure, personal, annual per family, annual per man (clothing, shoes, housekeeping utensils, non-essentials, food, taxes and insurance, gifts, books and magazines, doctor's bills, travelling expenses, hotel bills, tobacco, etc., wages and tips, pocket money for members of the family, sundries, 1908- (1908/9-1917/18; 1918/20 pt.2- ).

Social income, per 100 francs of capital invested, per hectare, by size of enterprise 1903- (1908/9-1917/18;



1918/20 pt.2- ); percentage of various classes of participants; contractual and noncontractual; labor and capital.

Income value. Value of inventory, and return per hectare; income value of enterprise per 100 francs. Value of inventory 1908- (1908/9-1917/18; 1918/20, pt.2- )

Influence of system of cultivation and categories of farming on results. Conditions of production (e.g. climatic conditions, quality of soil, marketing conditions, use of fertilizer); capital invested in livestock, fruit trees, buildings, machinery, etc., expenditures for wages, fertilizer, seed, fodder; household expenses; gross return, with and without forests; net return; income (agricultural, auxiliary, and economic). Among the systems of cultivation enumerated are three-field systems, grass and pasture lands in mountains and plains, and among the categories of farming and dairy farming, cattle raising, arable farming, fruit and vine growing, 1910- (1909/10-1917/18; 1918/20, pt.2- ).

Capital: Total area cultivated (number of enterprises, area cultivated per enterprise); capital in land; capital in buildings; in fruit trees; in landed estates; in cattle; in machinery and tools; circulating capital, by size of enterprises 1911- Summary of results 1901- (1911/12-1917/18; 1918/20, pt.2- )

Area cultivated, with and without forests. Capital at beginning of year (assets, debts, family capital), working days, (members of family, employes), by size of enterprises. 1901- (1923/24, pt.2- ).

Number of days of maintenance of household including the domestic servant, per enterprise; number of people maintained.

Number of days of maintenance of man, per size of enterprise, 1903- (1923/24, pt.2- ).

Cost of production per hectare of cultivated area, by size of enterprises. Depreciation; field inventory; decrease of provisions in storage; current expenses; wages; interest on capital; 1908- (1909/10-1917/18; 1918/20, pt.1- )

Gross return per hectare of cultivated area, by size of enterprises. Increase of provisions in storage; increased field inventory; return from sales of products, 1908- (1909/10-1917/18; 1918/20, pt.1- ).

Production for marketing and for use on the farm. Value in francs, by size of enterprise, and share of each in total gross return 1901/5; 1906/13, 1914/19; 1920- (1922/23, pt.1- ).

Net return per hectare of cultivated area, including forests, by size of enterprises, 1901- (1908/9-1917/18; 1918/20, pt.1- ).



Return on capital per hectare 1901/5; 1906/13; 1914/19; 1918- (1920/21, pt.1- )

Interest on debts and rent per hectare, 1901/5; 1906/13; 1914/19; 1920- (1923/24, pt.1- ).

Family labor earnings, per working day of a man, by size of enterprises 1901- (1908/9-1917/18; 1918/20, pt.1- ). per working day, 1915- (1918/20, pt.1- ); per working day, 10 hours, 12 hours, 1915- (1923/23, pt.1- ); 8 hours, 10 hours, 12 hours, 1915- (1925/26, pt.1- ).

Family farm earnings: total; per hectare; per working day of a man, 1901- (1908/9-1917/18; 1918/20, pt.1- ); without the household earnings, yearly by enterprise; per hectare; per working day of members of the family engaged on the farm, 1908- (1920/21, pt.1- ).

Average area cultivated by farmers with different sizes of farms; amount of capital invested; number of working days; number of persons maintained and number of days of upkeep, annually, 1901- (1923/24, pt.2- ).

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Fasc.1-3 in French.

Fasc.4: t.-p., German and French; text, German; table of contents and main headings, German and French.

Fasc.5: t.-p., French and German; text, French; table of contents and main headings, French and German.

Fasc.6: t.-p., German and French; text, German; table of contents and main headings, German and French.

U.S.D.A. has fasc.1-6 (1923-1929).

The six available numbers of this publication have been analysed in detail as an indication of the probable contents of future issues.

Contains statistics of (1) production (land, crops, livestock, dairy produce); (2) import and export of agricultural products; (3) prices and wages; (4) agricultural organization and training; (5) consumption of agricultural products; (6) farm management; (7) the relation of agriculture to the national economy of the country.

#### I. Production:

##### a) Land:

Statistics of land distribution: size of farms; number of farms; total area (with and without forests and pasture land); percentage of total area occupied by each group of farms of a certain size (with and without forests and pasture land). Figures from Federal census of 1905. (no.1-6). Area in hectares by cantons; total; productive; unproductive; 1912(no.1); 1923/24(no.2-6).

Land improvements planned; federal subsidies allotted and paid, 1918-1922(no.1); 1918-1924(no.2); 1918-1925(no.3);



1918-1926(no.4); 1920-1927(no.5); 1920-1928(no.6).

Land improvements carried out, 1885-1920, on flat and mountainous land. (no.1).

Land utilization; no. of enterprises; area, with and without forests. Figures from Federal Census of 1905. (no.1-3).

<sup>1</sup>Statistics of mountain pasture land, by cantons; number of pasture farms; total area in hectares; productive pasture farms; number of cows in pasture; length of summer season in days; number of days cows pastured; number of cows that pastured for 90 days. (no.1-6).

<sup>2</sup>Numbers of livestock on mountain farms: cows (milk and sterile), heifers; calves; bulls; young bulls and oxen; mares and foals; horses; asses and mules; sheep; goats; hogs. (no.2-6).

Forestry Statistics: total area; state forest land; communal and corporation forests; private forest land. (no.2-6). Area of state forest land, productive and unproductive. (no.4-6).

b) Crops:

Land utilization: area in hectares; arable land (total; planted in grain).

Meadows (natural, artificial); pasture land; gardens; vineyards; forests; marshland. Federal census of 1905 (no.1-6).

Area of fields and meadows per head of cattle. Average for 1920/22(no.1); 1920/24(no.2); 1920/25(no.3); 1920/26(no.4); 1920/27(no.5); 1920/28(no.6).

Area planted in grain (cereals) by cantons, 1905; yearly 1917-1919; 1921; 1922(no.1); 1905; 1917-1919; 1923; 1924(no.2); 1905; 1917-1919; 1924; 1925(no.3).

Area planted in grain (cereals), by varieties (winter wheat, summer wheat, winter rye, summer rye, spelt, maslin, barley, oats, maize, peas and beans, potatoes, beets, turnips, carrots, vegetables, industrial plants (rape, poppy, flax, hemp, chicory, tobacco) 1917; 1919; 1926. (no.4-6).

Area cultivated in grain (cereals), wheat, spelt, rye, barley, oats, maize.

Annual statistics of area, grain (cereals); wheat, spelt, rye, barley, oats, maize, 1913-1925(no.3); maslin, 1913-1926(no.4); 1913-1927(no.5); 1913-1928(no.6).

Statistics of area, bread grain, by cantons, 1917; 1919; 1926. (no.4-6).

Production per unit of area; average ten year percentage; winter wheat; summer wheat; spelt; winter rye; summer rye; winter barley; summer barley; oats; maslin; maize; potatoes;

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<sup>1</sup>Distribution of mountain pasture land: private; corporative; communal; mixed. (no.1-6).

<sup>2</sup>The mountain farms statistics refer to 1891 and are taken from the last volume of the Statistique Suisse des Alpagnes (Schweizerische Alpstatistik), 1914.



beets; carrots; turnips; tobacco; field vegetables; hay (natural and artificial meadows); autumn grass; pasture grass; apples; pears; cherries; prunes; nuts; wine; 1915-1922(no.1); 1917-1924(no.2); 1918-1925(no.3); 1919-1926(no.4); 1920-1927(no.5); 1921-1928(no.6).

Annual statistics of grain production (winter wheat; summer wheat; winter rye; summer rye; spelt; oats; winter barley; summer barley; maslin; maize) 1917-1922(no.1); 1917-1925(no.2); 1918-1925(no.3); 1918-1926(no.4); 1920-1927(no.5); 1918-1928(no.6).

Deliveries of grain (cereals) to the Confederation. Amount in tons (wheat, rye, spelt, maslin) 1917-1924(no.2); 1917-1925(no.3); 1917-1926(no.4); 1917-1927(no.5); 1917-1928(no.6); (barley, oats and maize) 1917-1919(no.2-6).

Deliveries of grain to the Confederation, and domestic consumption. By cantons. quantity. value. 1925; 1917-1925(no.3); 1926; 1917-1926(no.4); 1927; 1917-1926(no.5); 1928; 1917-1928(no.6).

Annual statistics of area, production, yield of potatoes. 1911-1922(no.1); 1913-1924(no.2); 1913-1925(no.3); 1913-1926(no.4); 1913-1927(no.5); 1913-1928(no.6).

Statistics of yield per hectare in quintals; by cantons; winter wheat; summer wheat; winter rye; summer rye; spelt; maslin; winter barley; summer barley; oats; maize; potatoes; beets; carrots; turnips; hay (natural and artificial meadows). Average for 1917/21(no.1-2); 1921/25(no.3-6).

Number of fruit trees (apple trees, pear trees, plum and prune trees, cherry trees, nut trees) (no.2-6).

Annual statistics of production of apples, pears, cherries, prunes, nuts 1912-1924(no.2); 1912-1925(no.3); 1912-1926(no.4); 1914-1927(no.5); 1914-1928(no.6).

Fruit available for sale, by wagon loads of 10,000 kg., pears for cider; apples for cider; table apples; prunes, 1916-1922(no.1); 1918-1924(no.2); 1919-1925(no.3); 1920-1926(no.4); 1921-1927(no.5); 1921-1928(no.6).

Utilization of an average fruit crop; consumption of fresh fruit; consumption of cider; fruit used for preserves; for distilling; for manufacture of non-alcoholic products; export; import (no.3-5); 1912/1922(no.6).

Annual statistics of area, production, yield of vines, price per hl., total value. 1900-1922(no.1); 1910-1924(no.2); 1911-1925(no.3); 1911-1926(no.4); 1911-1927(no.5); 1911-1928(no.6).

Production, import, export, consumption of wood, 1923 (no.2-3); production and consumption of firewood and timber 1924; 1925(no.4); 1925; 1926(no.5); 1926; 1927(no.6).

Production and yield of wood and timber in State and communal forests, 1922-1925(no.4); 1922-1926(no.5); 1922-1927(no.6).



c) Livestock and Dairy Produce:

Numbers of livestock (horses, mules, asses, cattle (total) cows, heifers, bulls (for breeding) hogs, sheep, goats) 1886; 1906; 1916; 1918; 1920; 1921 (no.1-2); + 1926 (prelim. figs.) (no.3-4); + 1926 (no.5).

Numbers of horses (under 4 years; stallions for breeding; mares for breeding; work horses); mules; asses; cattle (calves for slaughter; calves for breeding; from 1/2 to 1 year old; from 1-2 years old; over 2 years; cows; bulls from 1-2 years old; over 2 years; oxen from 1-2 years; over 2 years); hogs (boars for breeding; sows; hogs for fattening; farrows; others); sheep; goats (kids for slaughter; kids for breeding; he-goats; milk goats) 1886; 1911; 1916; 1918; 1921; 1926, (no.6).

Numbers of livestock owners (total; owners of horses; of cattle; of hogs; of sheep; of goats; those with 1-4 head of cattle; 5-10 head of cattle; 11-20 head of cattle; more than 20; livestock owners whose sole source of income is agriculture; those with other sources of income; livestock owners who do not farm.) 1886; 1906; 1916; 1921 (no.3); 1886; 1911; 1916; 1921 (no.4-5); 1886; 1911; 1916; 1921; 1926 (no.6).

Numbers of beehives with movable and non-movable honeycombs, 1911; 1918 (no.1-2); 1911; 1918; 1926 (prelim. figs.) (no.3); 1911; 1918; 1926 (no.4-6).

Numbers of poultry (hens; ducks and geese) 1918; 1921 (no.1-2); 1918; 1921; 1926 (prelim. figs.) (no.3); 1918; 1921; 1926 (no.4-6).

Livestock slaughtered under State inspection (bulls, oxen, cows, heifers, calves, sheep, goats, hogs, horses) 1910; 1915; 1920-1922 (no.1); 1910; 1920; 1922-1924 (no.2); 1910; 1920; 1922-1925 (no.3); 1910; 1920; 1922; 1924-1926 (no.4); 1910; 1920; 1922; 1924-1927 (no.5); 1910; 1920; 1922; 1925-1928 (no.6).

Livestock slaughtered (total, including livestock slaughtered on farms) calves, young cattle under one year, heifers over one year, bulls, oxen, cows; 1886; 1896; 1911; 1921 (no.1-2); + 1926 (no.3-5); 1896; 1911; 1921; 1926; 1928 (prelim. figs.) (no.6).

Beef production, net weight, 1886; 1896; 1911; 1921 (no.1-2); + 1926 (no.3-5) + 1928 (prelim. figs.) (no.6).

Pork production, net weight, 1896; 1911; 1921 (no.1-2); + 1926 (no.3-5); + 1928 (prelim. figs.) (no.6).

Mutton, goat meat, poultry, net weight, 1911; 1921 (no.1-2); + 1926 (no.3-5); + 1928 (prelim. figs.) (no.6).

Numbers of contagious diseases among domestic animals, 1886/89; 1890/94; 1895/99; 1900/4; 1905/9; 1910/14; annually 1909-1922 (no.1); + 1923-1924 (no.2); 1912-1925 (no.3); 1912-1926 (no.4); 1914-1927 (no.5); 1916-1928 (no.6). Damage to Swiss agriculture by foot-and-mouth-disease epidemic 1919/21 (no.6).

Milk Production:

No. of cows; no. of goats; annual production per cow and per goat; total production, 1866; 1876; 1886; 1896; 1901; 1906; 1911; 1916; yearly 1918-1922(no.1); + 1923; 1924(no.2); + 1925(no.3); + 1926(no.4); + 1927(no.5); + 1928(no.6).

Figures for the years 1916-1928 are estimates of the Swiss Milk Commission.

Milk Utilization:

Total production; for livestock consumption; for human consumption; for manufacturing purposes and export; 1866 and ten year periods to 1896; 1911; 1916; 1918-1922(no.1); + 1923; 1924(no.2); + 1925(no.3); + 1926(no.4); + 1927(no.5); + 1928(no.6). Figures for the years 1916-1928 are estimates of the Swiss Milk Commission.

Milk used for consumption of non-agricultural population and for by-products, 1911, 1920-1927(no.5); 1911, 1920-1928 (no.6).

Production of cheese, butter, condensed milk 1866; 1896; 1911; 1916; 1918; 1920-1922(no.1); 1866; 1896; 1911; 1916; 1918; 1920; 1923-1924(no.2); 1866; 1896; 1911; 1916; 1918; 1920; 1924-1925(no.3); 1866; 1896; 1911; 1916; 1918; 1920; 1925-1926(no.4); 1866; 1896; 1911; 1916; 1918; 1920; 1926-1927(no.5); 1866; 1896; 1911; 1916; 1918; 1920; 1927-1928 (no.6). No figures given for condensed milk for 1866.

Deliveries of milk to dairy and cheese societies; its utilization for the manufacture of cheese, butter, chocolate, and for consumption in 1922/23. By cantons (no.2-3)

Cheese supplied to members of the Swiss Cheese Union. Summer cheese, 1920/21-1926/27(no.4); 1920/21-1927/28(no.5); 1920/21-1928/29(no.6); winter cheese 1920/21-1925/26(no.4); 1920/21-1926/27(no.5); 1920/21-1928/29(no.6). Pre-war average 1912/13 (no.4-6).

II. Export and Import:

Export (value) of fruits, wine, meat, cattle, hogs, sheep and goats, dairy products, cheese, condensed milk, powdered milk, wood, 1916-1922(no.1); average 1906/13; 1918; 1921-1923 (no.2); average 1906/13; 1918; 1921-1925(no.3); average 1906/13; 1918; 1922-1926(no.4); 1906/13; 1918; 1923-1927(no.5); average 1906/13; 1918; 1923-1928(no.6).

Export (quantity) of above products, 1912; 1913; 1918; 1923-1926(no.4); 1912; 1913; 1918; 1924-1927(no.5); 1912; 1913; 1918; 1925-1928(no.6).

Export (quantity, country of destination), cheese, cattle, condensed milk, fruit, 1892/1905; 1906/1912; yearly 1912-1926(no.4); + 1927(no.5); + 1928(no.6). Figures for cattle and condensed milk are given in each case for the following half year.

Import (value), of agricultural products in competition with domestic products; forest products, field products,



animal products, poultry products, dairy products, fruits, vineyard products, vegetables, apiary products, tobacco, horses, cattle, 1916-1922(no.1); average 1906/13; 1918; 1920-1924(no.2); average 1906/13; 1918; 1921-1925(no.3); 1906/13; 1918; 1922-1926(no.4); 1906/13; 1918; 1923-1927 (no.5); forest products; field products (wheat, oats, maize, potatoes); animal products (veal, pork, other frozen meat, ham, other salted or smoked meat; frozen meat; other preserved meat; wool, raw and washed); (quantity, value) poultry products; eggs; dairy products (milk, butter, fresh, butter, salted, cheese); fruits; vineyard products (table grapes, wine grapes, wine); vegetables; apiary products; tobacco; horses; cattle, 1926-1928(no.6).

Import (quantity, value) of commodities of use to agriculture (e.g. machinery, fertilizer, seeds, fodder), 1920-1922(no.1); 1922-1924(no.2); 1923-1925(no.3); 1924-1926(no.4); 1925-1927(no.5); 1926-1928(no.6).

Total import and export by categories (value, country of origin and of destination) 1892/1905; 1906/12; 1913; 1914/1919; 1920/21; 1922(no.1); + 1920/22; 1923(no.2) + 1920/23; 1924(no.3); + 1920/24; 1925; 1926(no.4); + 1920/25; 1926; 1927(no.5); + 1920/26; 1927; 1928(no.6).

Import (quantity) of livestock and meat, oxen with and without milk teeth; bulls for slaughter, with and without milk teeth; cows for slaughter; cattle for slaughter; calves; hogs weighing more and less than 60 kg.; sheep; fresh veal; fresh pork; other fresh meat; ham; other salted or smoked meat; frozen meat; preserved meat; sausage meat; game; poultry (live and dead), 1906/13; 1913; 1918; 1924-1926; Jan.-June, 1927(no.4); 1906/13; 1913; 1918; 1926-1927; Jan.-June, 1928(no.5); 1906/13; 1913; 1918; 1926-1928; Jan.-June, 1929 (no.6).

### III. Prices:

Index numbers of agricultural products (based on average prices 1900-1909)(grain, potatoes, tobacco, wine (red and white), fruits with kernels (apples, pears); cherries; must and cider; vegetables; dry fodder; flax and hemp; cattle, milk; goats; calves; meat cattle; hogs and pork; sheep and mutton; eggs; honey; dairy products), 1892-1905; 1906-1913; 1914-1919; 1920; 1921; 1922(prelim. figs.); Apr., 1923(prelim. figs.)(no.1) + 1923; 1924; May, 1925(prelim. figs.)(no.2); + 1925; May, 1926(prelim. figs.)(no.3); + 1926; May, 1927(prelim. figs.)(no.4); + 1927; May, 1928(prelim. figs.)(no.5); based on average price for 1914, 1919; 1924-1928; May, 1929(prelim. figs.)(no.6).

Prices of agricultural products, annual average per 100 kg. (wheat, oats, hay, potatoes, wine, brandy, young milk cows, heifers, cows, goats, sheep, oxen, hogs, eggs, honey, pears,



apples, logs, milk, butter, cheese), 1911/13; yearly 1918-1922; Apr.-May, 1923 (no.1); 1911/13; 1918; 1919; highest price 1914/1922; 1923; 1924; Apr.-May, 1925, (no.2); 1911/13; 1918; 1919; highest price 1914/1922; 1924; 1925; May, 1926 (no.3); 1911/13; 1918/19; highest price 1914/1922; 1924; 1925; 1926; May, 1927 (no.4); + 1927, May, 1928 (no.5); 1914; highest price 1914/1922; 1926; 1927; 1928; May, 1929 (no.6).

Prices of commodities used in agriculture (e.g. fertilizer, machinery, timber) 1914; 1920; 1922; Apr.-May, 1923 (no.1); 1914; 1920; 1924; Apr.-May, 1925 (no.2); 1914; 1920; 1925; May, 1926 (no.3); 1914; 1920; 1926; May, 1927 (no.4); 1914; 1926; 1927; May, 1928 (no.5); 1914; 1927; 1928; May, 1929 (no.6).

Comparison of prices of agricultural products and prices paid by the farmer for necessary commodities and wages. A list of commodities or services and their value in wheat, potatoes, oxen, cows, hogs, milk, prewar; Aug. 1922; May, 1925 (no.2); prewar; Aug. 1922; May, 1926 (no.3); May, 1927 (no.4); May, 1928 (no.5); May, 1929 (no.6).

Agricultural wages (based on farm account books). Weekly wages in addition to board and lodging, cowherds, carters, farm servants, maids; daily wage in addition to board, in summer (for harvest), the rest of the year, 1911/13; 1914/19; 1920; 1921; 1922 (prelim. figs.) (no.1); 1911/13; 1914/19; 1920; 1923; 1924 (prelim. figs.) (no.2); 1911/13; 1914/19; 1920; 1924; 1925 (prelim. figs.) (no.3); 1911/13; 1914/19; 1920; 1925; 1926 (prelim. figs.) (no.4); 1911/13; 1914/19; 1920; 1926; 1927 (prelim. figs.) (no.5); 1911/13; 1914/19; 1926; 1927; 1928 (prelim. figs.) (no.6).

Estimated return for labor of farm owner and his grown sons and daughters, pre-war years, war years, post-war years (no.6).

Statistics of mortgage banks, capital, assets, liabilities, rate of interest, etc. 1925 (no.3); 1926 (no.4); 1927 (no.5); 1928 (no.6).

Comparison of Swiss index numbers and index numbers of wholesale prices, by groups of commodities (no.6).

Prices of farms and rents. Sale price based on a return value of 100 francs. Rent based on return value of 1000 francs, 1921/22-1926/27 (no.4); 1921/22-1927/28 (no.5); 1922/23-1928/29 (no.6).

Taxes for which farmers are liable, by cantons (no.4-6). Tariff rates on Swiss agricultural products, 1891-1927 (no.5-6) (wheat, fruit, vegetables, potatoes, honey, eggs, milk, butter, wine, oxen, hogs, beef, pork, lard, wood).

#### IV. Agricultural Organization and Training:

Membership of agricultural organizations, 1906; 1910; 1920; 1922 (no.1); 1906; 1910; 1920; 1924 (no.2); 1906; 1910; 1920; 1925 (no.3); 1906; 1910; 1920; 1926 (no.4); 1906; 1910; 1920; 1927 (no.5); 1906; 1910; 1920; 1928 (no.6).



Schools of agriculture (full-term and winter schools), no. of schools and no. of pupils, by cantons, 1893; 1900; 1910; 1915; 1920; 1921; 1922(no.1); 1893; 1900; 1910; 1915; 1920; 1923; 1924(no.2); 1893; 1900; 1910; 1915; 1920; 1924; 1925(no.3); 1893; 1900; 1910; 1915; 1920; 1925; 1926(no.4); 1893; 1900; 1910; 1915; 1920; 1925; 1926; 1927 (no.5); 1900; 1910; 1915; 1920; 1925; 1926; 1927; 1928(no.6).

Special schools (dairy and horticultural schools), no. of pupils, 1900; 1910; 1915; 1921; 1922(no.1); 1900; 1910; 1915; 1920; 1922; 1924(no.2); 1900; 1910; 1915; 1920; 1924; 1925(no.3); 1900; 1910; 1915; 1920; 1924-1926(no.4); 1900; 1910; 1915; 1920; 1924-1927(no.5); 1900; 1910; 1915; 1920; 1925-1928(no.6).

Federal assistance to agriculture. Amounts paid for various purposes, 1893; 1900; 1910; 1915; 1920; 1922(no.1); as above, 1893-1920; 1924(no.2); as above 1893-1920; 1925 (no.3); as above, 1893-1920; 1926(no.4); as above 1893-1920; 1926; 1927(no.5); 1900; 1910; 1920; 1926-1928(no.6).

Apportionment of Federal subventions, 1901; 1905; 1910; 1915; 1920; 1921(no.1); as above, 1901-1920; 1922; 1923(no.2); as above, 1901-1920; 1923; 1924(no.3); as above, 1901-1920; 1925; 1926(no.4); as above, 1901-1920, 1926(no.5); 1910; 1915; 1920; 1926-1928(no.6).

Expenditure of cantons for agricultural purposes, 1912; 1923(no.3-5).

#### V. Consumption of Agricultural Products:

Total consumption a) of home-grown products; b) of imported products (bread grain, potatoes, wine, beef, pork, mutton, goats' meat, poultry, eggs, honey, milk, cheese, butter, sugar, coffee, Southern fruits), 1896; 1911; 1921 (no.1-2); 1896; 1911; 1921; 1925(no.3); as above 1896-1921; 1926(no.4-5); 1911; 1921; 1926; 1928(no.6).

Consumption of foodstuffs (value), total and per capita, home-grown, imported, exported, 1896; 1911; 1921(no.1-2); 1896; 1911; 1921; 1925(no.3); as above, 1896-1921; 1926 (no.4-5); 1911; 1921, 1926; 1928(no.6).

Consumption of foodstuffs before and after the war. (Quantity and calorie content), meat and meat products; animal fats; poultry, game, fish, eggs, honey; milk and milk products; cereals, legumes, etc.; potatoes; fruit; vegetables; groceries; 1908/12; 1920/22(no.2-6).

Relation of domestic production to total consumption. (Quantity, percentage) 1908/12; 1920/22(no.2-6).

Cost of preparation, transformation and distribution of foodstuffs in Switzerland, 1922(no.2-6).

Consumption of milk, potatoes, meat and alcoholic beverages on Swiss farms, per adult, annually 1921-1925 (no.4); 1922-1926(no.5); 1923-1927(no.6).

Margin between producer's price for milk and retail price in Zürich, Berne, and Bâle, March, 1927(no.5-6).



## VI. Farm Management Statistics:

Gross return in francs, and percentage of total, production of grain, potatoes, sugar, hemp and flax, tobacco, hay, wine, fruit, vegetables, livestock raising (cattle, horses, hogs, sheep, goats, poultry), beekeeping, sericulture, dairying, middle eighties; middle nineties; 1911, 1920/21; 1922(prelim. figs.)(no.1); middle eighties; 1911; 1920/21; 1923; 1924(prelim. figs.)(no.2); middle eighties; 1911; 1920/21; 1924; 1925(prelim. figs.)(no.3); middle eighties; 1911; 1920/21; 1925; 1926(prelim. figs.)(no.4); middle eighties; 1911; 1920/21; 1926; 1927(prelim. figs.)(no.5); middle eighties; 1911; 1920/21; 1927; 1928 (prelim. figs.)(no.6).

Expenses of administration per hectare and daily household expenses per adult by size of farms, 1901/5; 1906/13; 1914/19; 1920; 1921; 1922(prelim. figs.)(no.1) as above, 1901-1919; 1922; 1923; 1924(prelim. figs.)(no.2); as above; 1924(no.3); as above 1901-1919; 1923-1925(no.4); as above, 1901-1919; 1924-1926(no.5); as above, 1901-1919; 1925-1927 (no.6).

Cost of production per hectare (expenditures for stock and machinery, taxes, interest, wages, etc.), 1908/13; 1914/19; 1920; 1921; 1922(prelim. figs.)(no.1); 1908/13; 1914/19; 1922; 1923; 1924(prelim. figs.)(no.2); 1908/13; 1914/19; 1922-1924(no.3); 1908/13; 1914/19; 1925-1925(no.4); 1908/13; 1914/19; 1924-1926(no.5); 1908/13; 1914/19; 1925-1927(no.6).

Percentage distribution of cost of production (expenditures as above), 1908/13; 1918-1921; 1922(prelim. figs.)(no.1); 1908/13; 1918-1923; 1924(prelim. figs.)(no.2); 1908/13; 1918-1924(no.3); 1908/13; 1918-1925(no.4); 1908/13; 1918-1926 (no.5); 1908/13; 1918-1927(no.6).

Gross and net return in francs per hectare, by size of farms, 1901/5; 1906/13; 1914/19; 1920; 1921; 1922(prelim. figs.)(no.1); 1901/5; 1906/13; 1914/19; 1922; 1923; 1924 (prelim. figs.)(no.2); 1901/5; 1906/13; 1914/19; 1922-1924 (no.3); 1901/5; 1906/13; 1914/19; 1923-1925(no.4); 1901/5; 1906/13; 1914/19; 1924-1926(no.5); 1901/5; 1906/13; 1914/19; 1925-1927(no.6).

Gross return in francs per hectare, by systems of cultivation (e.g. three field system, various forms of pasturage), 1901/5; 1906/13; 1914/19; 1920; 1921(no.1); as above 1901-1919; 1922; 1923(no.2); as above 1901-1919; 1923-1924(no.3); as above 1901-1919; 1924; 1925(no.4); as above 1901-1919; 1925; 1926(no.5); as above 1901-1919; 1926; 1927(no.6).

Return in francs per head of horned cattle, by systems of cultivation, 1914/19; 1920-1922; 1914/22(no.1); 1920-1924; 1914/24(no.2); 1921-1925; 1914/25(no.3-5); 1924-1928; 1914/28(no.6).



Income per day per member of the farmer's family engaged in farm or housework, by size of farms, 1901/5; 1906/13; 1914/19; 1918-1921(no.1); + 1922; 1923(no.2); + 1924(no.3); + 1925(no.4); + 1926(no.5); + 1927(no.6).

Capital and indebtedness per hectare, 1901/20; 1921 (no.1); 1901/23; 1923(no.2); 1901/24; 1924(no.3); 1901/5; 1906/13; 1914/19; 1920/22; 1923-1925; 1901/25(no.4); 1901/5; 1906/13; 1914/19; 1920/22; 1923/26; 1924-1926; 1901/26(no.5); 1901/5; 1906/13; 1914/19; 1920/22; 1923/26; 1925-1927; 1901/27(no.6).

Estimate of capital invested in Swiss agriculture (land, improvements, building, plants, livestock, implements and machinery, debts), 1911; 1919; 1926(no.5-6).

Cattle mortgages, 1921-1927(no.5); 1922-1929(no.6).

Cost of production (itemized) of 1 hl. of wine, 1906/23 (no.3); 1906/13; 1914/19; 1920-1923; 1906/23(no.4); 1906/13; 1914/19; 1920/22; 1923/25; 1925; 1926; 1906/26(no.5); as above, 1906-1925; 1925; 1926; 1927; 1906/27(no.6).

Cost of production (itemized) of one egg, 1924; 1925 (no.3); + 1926(no.4); + 1927(no.5); + 1928(no.6).

Cost of production of 1 kilog. of honey, 1912/24; 1924(no.3); + 1925(no.4); + 1926(no.6).

Viticulture - Profitability (cost of production per hectare; per hl. of wine; return in hectolitres of wine per hectare; gross and net return in francs per hectare) 1900/13; 1914/19; 1920-1923; 1906/23(no.4); 1900/13; 1914/19; 1920/22; 1923/25; 1925; 1926; 1906/26(no.5); 1900/13; 1914/19; 1920/22; 1923/25; 1926; 1927; 1906/27 (no.6).

Influence of the kind of enterprise on its success. (Dairying; livestock raising) no. of balances - gross return per hectare; expenditure per hectare; net return per hectare and as percentage of the assets, 1904/13; 1914/19; 1920/22; 1923/26; 1926(no.5); 1904/13; 1914/19; 1920/22; 1923/27; 1927(no.6).

Estimates of yield, price per 100 kg., value per are in 1929 of grass (natural and artificial meadows); grain and straw of winter and summer wheat, spelt, winter and summer rye, emmer, winter and summer barley, oats; potatoes; beets; rutabagas(no.6).

VII. The relation of agriculture to the national economy of Switzerland:

Movement of the population; various classes of industry; 1870; 1888; 1900; 1910(no.1) + 1920(no.2-6).

Classification of agricultural population, 1888; 1900; 1910(no.1); 1888; 1900; 1910; 1920(no.2-6).

Estimate of the national wealth (rural and urban property, forests, mines, insured and non-insured property) 1913; 1919(no.1-6).



Estimate of Swiss national income (mines, agriculture, forestry, etc.) 1913; 1919(no.4-6).

Agricultural Expenditure (itemized) 1926(no.6).

Influence of the fluctuations in the gross return on agricultural expenditure (gross return per hectare; total expenditure per hectare exclusive of forests; expenditures for equipment, buildings, fertilizer, fodder, interest, household and personal expenses) yearly, 1923-1927.

U.S.D.A. Union suisse du commerce et de l'industrie. Rapport sur le  
262 commerce et l'industrie de la Suisse ... 1878/79- Zurich,  
Un32 1879-

Published also in German.

L.C. 1905 has title: Bericht über Handel und Industrie der  
HC395 Schweiz.

.U6 U.S.D.A. has 1905, 1924-1929.

L.C. has 1878/79, 1916, 1917, 1919, 1921-1929.

Annual statistics of import and export of grain and vegetables, flour, 1876/77, 1877/78, 1878/79; monthly statistics of import and export of wheat, July-June 1876-77, 1877/78, 1878/79; July-Sept., 1879 (1878/79).

Monthly prices of 100 kg. of Hungarian flour on the grain market of Zurich, 1876/77, 1877/78, 1878/79, July-Oct., 1879 (1878/79)

Annual statistics of import and export of sugar and syrup, coffee, chicory, etc., cocoa beans, cotton, 1876/77, 1877/78, 1878/79; silk, 1877/78, 1878/79 (1878/79).

Monthly prices of 100 kg. of Parisian lump sugar at Bâle, July-Nov., 1878, Jan., Apr., May, June, 1879; 50 kg. of Java coffee at Bâle, July-Nov., 1878, Jan., Apr., May, 1879 (1878/79).

Numbers of livestock: horses, cattle, hogs, sheep, goats, 1866, 1876, 1886, 1896, 1901; mules, asses, bees, 1876, 1886, 1896, 1901(1905); horses, mules, asses, cattle, hogs, sheep, goats, 1886; 1896, 1901, 1906, 1911, 1916 (1916-1917); horses, mules and asses, cattle, hogs, sheep, goats, 1866, 1876, 1886, 1896, 1906, 1916, 1918, 1919(1919); 1866, 1876, 1886, 1896, 1906, 1916, 1920, 1921(1921-1925)+ 1926(1926-1929); bees, 1886, 1896, 1901, 1911(1916-1917); 1876, 1886, 1896, 1901, 1911, 1918(1919-1925)+ 1926(1926-1929); poultry, ducks and geese, 1918, 1921(1921-1925)+ 1926(1926-1929).

Value of agricultural production: grain, potatoes, sugar beets, hemp and flax, tobacco, hay, wine, fruits, vegetables, livestock raising (cattle, horses, hogs, sheep, goats, poultry), beekeeping, sericulture, dairy products, 1914-1918(1919).

Gross return from agricultural production of above products, 1885, 1895, 1911, 1920(1921); 1885, 1895, 1911,



1921/21, preliminary figures for 1922(1922); 1885, 1895, 1911, 1922, preliminary figures for 1923(1923); 1885, 1895, 1911, 1923, preliminary figures for 1924(1924); 1885, 1895, 1911, 1924, preliminary figures for 1925(1925); 1925-1928 with preliminary figures for succeeding year (1926-1929).

Area and utilization of the soil (meadows, pastures, arable land, land used for horticulture, for vineyards, forests), by sizes of enterprises, 1905 (1923-1929).

Area and number of producers: grain, hoed crops, vegetables, legumes, industrial plants, 1917(1917); 1917,(1919); 1917, 1919; 1926(1927-1929).

Cost of living. Quarterly expenditure in francs, and index numbers according to type of occupation, for foodstuffs, heat and light, 1921, 1922(1922), 1922, 1923(1923), 1923, 1924(1924); monthly expenditure; 1921(1921).

Cost of living, index numbers, cities, annual average 1921-1929, monthly 1925-1929(1925-1929).

Index numbers of wholesale prices, Jan., Apr., July, Oct., Dec., 1920-1927(1921-1927), monthly, 1928, 1929.

Annual statistics of import and export (value), 1913-1929(1919-1929).

Annual statistics of import and export (quantity, value, countries of origin and of destination), silk; cotton; wool; flax, hemp, jute and ramie; straw and hair; paper; wood; hides; skins; rubber; horses; oxen; bulls; cows; calves; hogs, sheep; cheese; butter; milk (fresh, condensed); wheat; rye; oats; maize; beans; peas; rice; flour; bread; grapes, wine; barley; malt; hops; beer; cocoa; chocolate; tobacco; coffee; chicory; tea; sugar; spices; fats and oils; oranges and lemons; figs, almonds, nuts; other Southern fruits; meat; hay; oil-cakes.

## SWITZERLAND

A GUIDE TO OFFICIAL STATISTICS ON AGRICULTURE  
POPULATION AND FOOD SUPPLY

## PART II. - METHODS OF COLLECTION AND ANALYSIS OF OFFICIAL STATISTICS

By J. D. Black and Fritz Bachman  
For the Bureau of International Research  
of Harvard University and Radcliffe College

Assisted by  
André Borel and Oskar Howalt  
Secrétariat des Paysans Suisses and  
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A. Statistical Organization of Switzerland

The political organization of most countries furnishes the framework for their statistical organization. The present political organization of Switzerland dates from 1848 when the cantons, already loosely jointed together, adopted a constitution creating a federal state with a central government. In many respects, however, the cantons remain independent. There are 22 of them, three of which are divided into half-cantons, each with its own government. For administrative purposes, the canton is divided into districts and these districts into communes, which are the smallest political units. In one canton, the "Municipality," consisting of 1-6 communes, makes an administrative unit intermediate between the district and commune. From 1850 to 1920 the number of districts increased from 183 to 186. The number of communes, on the other hand, decreased during the same period from 3063 to 3003, several of the communes having amalgamated.

Federal Statistics

When in 1848 Stefano Franscini, author of several books on statistics in Switzerland, became the first Secretary of the Interior, he outlined at once a program for collecting data on population, land utilization, agricultural production, foreign trade, etc. He was greatly hampered, however, in carrying out his program by the unwillingness of several cantons to cooperate and by lack of funds. Nevertheless, in 1850 the first federal population census was taken, and by 1858 there had appeared

altogether five volumes containing, besides the results of this census, information on land utilization, statistics on foreign trade and vital statistics for the years 1850-52.

On January 21, 1860, an act was passed establishing an independent Bureau of Statistics. This Bureau developed gradually and is still in existence. Its chief work consists in taking the regular censuses of population (every 10 years) and of livestock (every 10, later every 5 years). Since 1867 this Bureau has had charge of collecting and publishing the vital statistics. In 1905 and again in 1929 it organized the censuses of enterprises. In 1912 and 1923 it compiled statistics on land utilization. After the war it started upon the analysis of family budgets and collected data on wages of factory workers. It also began collecting data relating to taxation.

Some of these subjects and many others taken up in earlier years have been dropped, or the work has been taken over by other bureaus of the federal government. Thus since the eighties foreign trade statistics have been compiled by a separate division of the Bureau of Customs. The work on family budgets has been taken over by the newly established Federal Labor Office, which is also in charge of wage statistics. The statistics on taxation are made at present by the Federal Bureau of Taxation.

With regard to the method generally followed in collecting the statistical data, the Federal Bureau of Statistics is obliged to work in close cooperation with the governments of the cantons. The field work is done by local or district authorities. In the censuses the public at large is required to cooperate actively, for the method of self-enumeration was adopted at the very beginning (1860). The expenses of the cantons are refunded by the Federation on a per-capita basis.

There are several other federal departments collecting important statistical data. The Federal Bureau of Forestry supplies yearly tables on production of wood and timber. The Veterinary Office compiles some figures on meat production. The Weather Bureau keeps record of the climatic conditions in the country, and the Swiss National Bank makes numerous tables and charts relating to the financial situation, interest rates, etc. Those results are not always published as "statistics," but are merely incorporated in the yearly reports of the departments.

#### Cantonal and Communal Statistics

At about the same time that the Federal Bureau of Statistics was set up, a few of the larger cantons established statistical offices of their



own. Though their activity was restricted to their respective territories, the work performed was very useful. For example, these offices collected the only statistical data available in Switzerland regarding agricultural production. Besides, these bureaus very frequently cooperate in the work of the Federal Bureau.

The activity of the statistical offices established by some of the larger cities lies more in the field of "social statistics," dealing for example with unemployment, rents, family budgets, etc. Moreover, they collect price statistics and construct cost of living indices.

#### The Swiss Farmers' Secretariat

The Swiss Farmers' Secretariat was founded in 1898 by the Swiss Farmers' Union. It is subsidized by the Federal Government and supplies the International Institute of Agriculture in Rome with statistics for Switzerland and collaborates with it in other ways.

Under the very able leadership of Professor Ernst Laur, the Secretariat compiles much data relating to agriculture, for example, statistics on production and consumption, by means of specially conducted enquêtes or by an established organization of crop and price reporters. Much information also is obtained from the approximately five hundred farm account books which have been analyzed and worked up by the office since 1901. In 1928, the staff numbered from 60-70 persons.

#### Associations

The establishment of the Schweizerische Statistische Gesellschaft in 1864 has contributed to the development of Swiss statistics. This body consisting of teachers, statesmen and others who are interested publishes a periodical, Zeitschrift für Schweizerische Statistik appearing 3 or 4 times a year, in which statistical and economic problems are discussed. The association itself undertakes no statistical work, though it frequently plays an active part in the promotion and preparation of such studies.

In connection with the natural bases of economics in Switzerland, mention should be made of the Schweizerische Naturforschende Gesellschaft. It is the association of the natural scientists and is subdivided into several groups. It plays an important part in the organization of the study of natural conditions in the country.

## Bibliography - General Comments

The official statistics compiled by the Federal Bureau of Statistics have been published under different titles. From 1850 to 1858 the five volumes already referred to (see p. 1) appeared under the title, Beiträge zur Statistik der Schweizerischen Eidgenossenschaft. From 1860 to 1918, the title was Schweizerische Statistik. The volumes were numbered consecutively (1-217). In 1919 the title was changed to Schweizerische Statistische Mitteilungen and only the volumes published in the same year were numbered consecutively. The number of volumes published in a given year varied much. Since 1929 the title has read Statistische Quellenwerke der Schweiz and the volumes have been numbered consecutively as was done from 1860 to 1918. Up until October 1930 about 10 numbers have been published.

In 1891 the Federal Bureau of Statistics started the edition of the Statistisches Jahrbuch der Schweiz (Statistical Yearbook of Switzerland). It contains official and unofficial statistics and is by far the most comprehensive source of information.

The Landwirtschaftliches Jahrbuch der Schweiz (Agricultural Yearbook of Switzerland), which has been published since 1887 by the Federal Department of Economics, on the contrary, does not contain much statistics. It gives, however, the summary tables of the farm account books as worked up by the Farmers' Secretariat. Here are also published the reports of the state experiment stations and some other scientific papers relating to agriculture.

The statistical bureaus of the cantons and the cities publish their own series of reports, mostly under the title Statistische Mitteilungen des ... Some statistical returns, however, are merely printed in departmental reports, but can often be found reprinted in the Statistical Yearbook.

The Swiss Farmers' Secretariat is publishing a series of bulletins called Mitteilungen des Schweizerischen Bauernsekretariates. Most of the results of the enquêtes are published here. Since 1923 a special bulletin has been published yearly under the title Statistische Erhebungen und Schätzungen auf dem Gebiete der Landwirtschaft. It contains all available statistics and estimates relating to agriculture.

With a few exceptions, all statistical publications issued by the Federal Administration are printed in German and French and the reports of the cantons and cities in their respective official languages. The bulletins of the Swiss Farmers' Secretariat are also published in both languages. Periodicals contain articles in both languages.



B. Natural Bases of Agriculture

Geology, Topography and Soil

In Part I the only source listed is Landwirthschaftliches Jahrbuch der Schweiz. This contains, in addition to the data listed in Part I, many reports on chemical analysis of soils, official reports of the state experiment stations, and, very frequently, other scientific papers.

A list of most important other sources of information follows. Some are official, though not in Part I, as they do not take the form of agricultural statistics.

- Heim, Albert - Geologie der Schweiz.  
" " - Geologische Karte der Schweiz.  
" " - " " " " (scale 1:500.000)  
" " - " " " " ( " 1:100.000  
in 25 parts)  
Amsler, Alfred und Näf, A. - Gesteins und Bodenkunde, Boden-  
bearbeitung.  
Atlas der Schweiz. (Geographischer, Volkswirt-  
schaftlicher, Geschichtlicher,  
1909)  
Duvetenay - Atlas Geographique, Historique et Statistique, 1848.  
Topographischer Atlas der Schweiz.  
Geographisches Lexikon der Schweiz. Vol. 4, pp.626-706.  
Das Schweiz. Dreiecksnetz 1881-1890, vol. 1, 4 & 5.  
Wolf, Jul. Geschichte der Vermessungen in der Schweiz, 1879.  
Früh, J. Geographie der Schweiz, 1930.

The history of the topographical survey work in Switzerland dates back several hundred years. The maps now available for the whole country were planned in 1832, and worked out by the Federal Bureau of Topography, created in 1837. The scale for the mountainous parts of the country was 1:50,000, and for the plains, 1:25,000. Until 1869, only 25 maps, in the scale of 1:100,000, were available. Afterwards the publication of the original survey maps was started. (See: Topographischer Atlas der Schweiz). For a detailed description of the methods applied in taking the survey see: Das Schweiz. Dreiecksnetz. A short description is given also in Geographisches Lexikon der Schweiz, vol. 4, p.626 and following. In the Geographie der Schweiz, there is an up-to-date description of the new maps of the country and the method of survey-taking.

As regards the geological structure of Switzerland, the most important work is that written by Professor A. Heim. Very careful maps

have been published, based on his investigations. (See: Geographisches Lexikon, Geographischer Atlas der Schweiz, and Geographische Karte der Schweiz). The Geographisches Lexikon also gives a good description of the geological formation of the country. The book by Amslern and Näf is primarily written as a textbook for agricultural colleges, and is based on the work of Heim.

### Climate and Rainfall

Sources listed in Part I are Statistisches Jahrbuch der Schweiz (Südgenössisches Departement des Innern), showing atmospheric pressure, relative humidity, rainfall each month, and temperature; Annuaire Agricole de la Suisse; and Union Suisse des Paysans: Recherches Relatives à la Rentabilité de l'Agriculture, containing, in the introduction, a very short statement about atmospheric conditions prevailing during the year and those affecting agriculture particularly.

The important other sources of information are as follows:

Geographisches Lexikon der Schweiz. Vol. 4, p.706-711.

Schweiz. Meteorologische Beobachtungen, 1864-1880.

Annalen der Schweiz. Meteorologische Zentralanstalt, 1881 ff.

The Swiss Weather Bureau was set up in 1863 as a private institution subsidized by the cantons. In 1881, it was taken over by the Federal Government. About 120 stations, evenly distributed over the country, report to the Bureau the main results of their observations, which are made according to uniform instructions.\* In addition to these stations, there are more than 300 other places where records are taken of the amount of rainfall. A map indicating the location of all these stations may be found in Geographischer Atlas der Schweiz, (map No. 26). The individual records are summarized and worked up by the Central Bureau in Zürich, and the results are published yearly in the Annalen der Schweiz. Meteorologische Zentralanstalt.

On the basis of these reports, many different charts and maps have been drawn up, which may be found in the Geographisches Lexikon, p. 706 ff. A map dividing the country into zones, with different average amounts of rainfall, may be found in the Geographischer Atlas, (map No. 26).

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\* In 1928 the number of stations was 122. The map in the Geographischer Atlas der Schweiz which was published in 1909 indicates the number of stations at that time. Newer maps are available. For example Atlas für Schweiz. Sekundar Schulen, 1924.



It may be added that records are taken, by a special institute in Zürich, of the earthquakes occurring in Switzerland and elsewhere. These records are published yearly in the *Annalen der Schweiz. Meteorologischen Zentralanstalt*.

### Natural Vegetation

- Geographisches Lexikon der Schweiz, vol. 4, p.711-762.  
Brockmann-Jerosch, Heinrich - Die Vegetation der Schweiz, (in publication) vol. 1, 1925-29.  
Gremli - Excursionsflora für die Schweiz.  
Fischer, E. - Flora Helvetica.  
Schröter, C. - Das Pflanzenleben der Alpen. Flora der Eiszeit.  
Ratzeburg - Die Standortsgewächse etc. in ihren Beziehungen zur Forst- und Landwirtschaft.  
Empeyta, Eugène - Catalogue Descriptif des Arbres - en Suisse, 1887.

A short description of the natural vegetation in Switzerland may be found in *Geographisches Lexikon*, vol. 4, p.711. The leading authorities on this subject are quoted there, as for example, Schröter, Schinz, Fischer and Gremli.

The work described in publications by Brockmann-Jerosch is of a somewhat different type, inasmuch as it tries to work out the relation between the vegetation, the atmospheric conditions, the geological formation of the country, and the types of soil. It contains good maps and numerous charts. It also contains a map showing the different types of farming prevailing in the country.

### C. Definition of Agriculture

The Swiss censuses of 1905 and 1929, which included agriculture, were censuses of "enterprises." They included as agricultural enterprises those keeping poultry and bees, and those producing vegetables and flowers. Forestry was included, if combined in the same enterprise with agricultural operations. Enterprises such as cheese factories and cider factories were classed as industrial, but totaled with the agricultural enterprises in some of the tables. Hunting and fishing were separate types of enterprises.

In the recent United States censuses, the term "agricultural operations" is used as a general term referring to the work of growing crops, producing other agricultural products, and raising domestic animals, poultry and bees. Woodland operations are included wherever carried on

along with agricultural operations of sufficient magnitude to constitute a "farm," as defined in Section D.

The recommendations for the world census of agriculture are to include all forest land being exploited, whether in enterprises along with agriculture or not. The schedule recommended, however, permits separating out the strictly forest enterprises.

In the recommendations of Dr. Ernst Laur, accepted by the International Institute of Agriculture as a basis for an international system of farm accounting, forestry operations are to be kept separate from agriculture "whenever the importance of forestry is considerable," and more especially on large-sized farms. Hunting and fishing are to be part of agriculture if incidental to it; and artificial fish culture in ponds is to be called agriculture. But "vegetable growing or truck farming on an industrial scale, or with the aid of warm greenhouses and floriculture under similar circumstances, will be better considered as a non-agricultural enterprise." (p.35-36).

The forestry of the United States and similar countries consists of little else than lumbering; and lumbering probably needs a special type of schedule. The information called for in the recommended world census schedule is not adequate for this purpose. It is suited especially to the European types of forestry operations. The best procedure would seem to be to have a separate schedule for forestry and agricultural operations, and make combinations of them into single enterprises later, if this seems desirable.

#### D. Number of Farms

Sources listed in Part I are Ergebnisse der Eidgenössischer Betriebszählung vom 9. August, 1905, a census of industrial and agricultural enterprises, some of the results of which are also published by the Union Suisse des Paysans in Statistiques et Évaluations Agricoles; Schweizerische Statistik, vol. 1-217, 1860-1919; Schweizerische Statistische Mitteilungen, 1919-1929; and Wirtschaftliche und Sozialstatistische Mitteilungen, (no. 12 (Dec. 1930) contains some preliminary results of the farm census of 1929).

Until now, only two censuses of farms have been taken in Switzerland, the first one in 1905, the latter in August, 1929. In both cases, the farm census was a part of a census of "enterprises." The schedules were prepared by the Federal Bureau of Statistics, and submitted to the governments of the cantons. A committee of experts then worked out the final



form of the schedule, which afterwards was adopted by the Federal Council. The census was carried out with the cooperation of the cantonal-district-and communal authorities. The cantons received a subsidy from the federal government in proportion to their population. As in the population census\*, the commune was taken as the smallest political unit. For every fifty enterprises, an enumerator was appointed who was responsible for the distribution of the blanks to the heads of these enterprises, and who had to assist, if necessary, in filling out the schedule correctly.

The 1905 census was taken on August 9. Separate blanks were provided for agricultural enterprises, for industry and trade, and for home industry. These classes were subdivided again, and these subdivisions finally into a total of 351 types of business enterprises. Class A included "enterprises producing raw materials," and was divided into the three groups, (a) mining, (b) agriculture, cattle breeding, gardening and other enterprises connected with agriculture, (c) forestry (not connected with agricultural enterprises), hunting and fisheries. Group (b) included 29 different types of agricultural enterprises, not all of which, however, can be called "agricultural" properly, as for example, the "raising of dogs," or "cheese and butter factories," distilleries, and cider factories. Group (c) is subdivided into only three items: forestry enterprises (for which the census was taken by the Oberforstinspektorat), hunting, and fishing. Such enterprises as sugar factories and condenseries were scheduled as manufacturing enterprises, and all trade enterprises dealing with agricultural products were included in Class C, Trade, which was subdivided into such classes as C-a, trade with animals (horses, livestock, pigs, etc.); C-b, trade with agricultural products in the narrower sense, such as cereals, tobacco, etc.

One difficult problem with which this census had to deal was a clear definition of an "enterprise."\*\* Unfortunately, no clear definition was worked out, which resulted in much confusion. For agriculture, the problem was made comparatively simple by setting up a minimum of one-half hectare of land as constituting a farm. But a large number of small holdings were not enumerated as a result, especially in regions where wine culture is predominant. Some difficulty also arose in counting the "Alps," or mountain pastures. For the "special types of farms," like bee keeping, poultry farming, etc., the necessary requirement of half a hectare of land was abandoned, and the decision as to whether such an enterprise should be counted or not was left to the enumerators. Those enterprises classified

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\* See Section E.

\*\* See vol. I<sup>8</sup>, p. 15<sup>x</sup>. The "definition" given there is, in fact, no definition, and is, moreover, contrary to the principal aim of enumerating the "enterprise as such."

as agricultural but not having half a hectare of land, as for example, cider factories, cheese factories, etc., were considered as "industrial enterprises," inasmuch as they were recorded on the same kind of blanks as the regular industrial enterprises. But they were added to the group of agricultural enterprises in the final classification. In the tables of Volume 2<sup>2</sup>, these enterprises are listed separately from the farms, so that one can omit them if one wishes.

The "actual farms" are grouped according to their size throughout, in the following usual manner:

0.5	to	3	hectares
3.01	"	10	"
10.01	"	15	"
15.01	"	30	"
30.01	"	70	"
70.01	"	and over	

In a supplement\* to this volume, a more detailed classification has been worked out with 21 size-groups ranging from under 1 ha. to over 100 ha. These latter are published by districts only, the others by cantons.

In conformance with the recommendation of the International Institute of Agriculture in Rome (see p. 26), the following size-groups are distinguished in the preliminary census report for 1929:

Class I	I	0	-	0.25	hectares
"	II	0.26	-	0.50	"
"	III	0.51	-	1.00	"
"	IV	1.01	-	3.00	"
"	V	3.01	-	5.00	"
"	VI	5.01	-	10.00	"
"	VII	10.01	-	15.00	"
"	VIII	15.01	-	20.00	"
"	IX	20.01	-	30.00	"
"	X	30.01	-	50.00	"
"	XI	50.01	-	70.00	"
"	XII	70.01		and more	"

This classification makes it possible to compare the number of farms in 1929 with the number in 1905, for the same size-groups.

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\* See: Die Betriebe der ~~U~~produktion. Nachtrag zum Zweiten Bande - Schweiz. Statistik, Lief. 172.



The Federal Statistical Office has classified the total number of farms according to different types. The nine classifications for 1905 are as follows:

1. Forest farms: over 70 per cent of the land in forests.
2. Pasture farms: pasture land constituting over 50 per cent of the land in cultivation (woodland deducted).
3. Wine-culture: vineyards comprising over 25% of the land cultivated (woodland deducted).
4. Gardening: gardens comprising over 33 1/3% of the land cultivated (woodland deducted).
5. Farms with litter production: land used for litter production comprising over 50% of the land cultivated (Woodland deducted).\*
6. All grass farms: arable land not more than 2% of the land cultivated (woodland deducted).
7. Grass farms with some arable land: with arable land constituting 2-10% of the land cultivated (woodland deducted).
8. Farms with much arable land: arable land comprising over 10% of all cultivated land, and up to half of this arable land in cereals.
9. Farms with much arable land: arable land comprising over 10% of all land (deducting woodland) and over half of the arable land in cereals.

For 1929, there were 17 different classifications. The following table combines the two classifications, and gives figures published in the preliminary report:

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\* "Litter" is a native grass growing on marsh and heathland which is cut and dried and then used like straw for the beds of the cattle in the stables.

Classification of farming system 1929	Number of farms 1929	Number of farms 1905	Classification of farming system 1905
1. Forest farms	2,693	1,554	1.
3. Pasture farms	7,189	11,172	2.
4. Wine-culture: vineyards comprising from 25 - 75% of the land cultivated	3,611 )		
5. Same: vineyards over 75% of the land cultivated	2,460 )	9,025	3.
7. Gardening (agricultural)	749	709	4.
8. Farms with litter etc.	303	799	5.
9. All grass farms, etc.	46,772	53,346	6.
10. Grass farms, etc.	40,045	31,342	7.
11. Farms with much arable land: arable land 10-30% of all cultivated land, and up to half of this arable land in cereals	30,361 )		
12. Same: arable land over 30% of all cultivated land, and up to half of this arable land in cereals. Fodder crops more than 40% of all cultivated land.	16,106 )		
13. Same as 12, but: Fodder crops less than 40% of all cultivated land	29,998 )		
14. Farms with 10-30% arable land of all cultivated land and over 50% of the arable land in cereals	23,639 )		
15. Farms with more than 30% of all cultivated land arable and over 50% of the arable land in cereals	17,401 )		
	6,071 )	59,138	8.
	41,040 )	76,643	9.
Total	221,327	243,710	

The above figures are strictly comparable, except for class 3(1929) where the decrease is due to a change in the method of enumeration (this can most likely be proved when the final results of the area in farms appear), and for classes 4, 5 and 7 (1929), in which 2,669 farms with less than 0.50 hectares per farm were included. In the 1905 census, farms with less



than 0.50 hectares were not included.\*

The remaining classes of farms for 1929 are as follows:

Class 2. Forest enterprises	Tabulations not completed
6. Gardening (non-agricultural: gardening is the main occupation or also only the occasional occupation as a sideline to non-agricultural work)	" " "
16. Small planters: farms with less than 0.50 ha. of cultivated land if it is not mostly used for vineyards or gardening. (This class includes also all "Farms without land.")**	17,352
17. Fisheries	Tabulations not completed

In the classification for 1929, the woodland is always deducted from the area of the farm before classifying it.

The 1905 census has no comparable figures for class 16 because, in the census for that year, the farm limit was fixed at 0.50 hectares and only special types of farms below this acreage were enumerated.

No figures for classes 2, 6 and 17 were published in the above preliminary report.

These different types of farms have been analyzed for 1905 (and probably will be for 1929) in detail by cantons as to their land utilization, land tenure and farm labor. Several maps are added to Vol. 2<sup>2</sup>, which

\* The reason that the results are not strictly comparable is that different definitions were used in the censuses of 1905 and 1929. The Statistical Office, however, has made some estimates in order to adjust the 1929 results to those of 1905.

\*\* That all of the farms below 0.50 ha. are not included in class 16 is shown by the following figures:

Class number	No. of farms with less than 0.50 ha.
4	1127
5	1330
7	212
	<u>2669</u>
16	17352
	<u>20021</u>
Farms with 0 - 0.25 ha.	5635
" " 0 - 0.50 ha.	<u>14386</u>
	20021

present for all districts in Switzerland the density of agricultural population in relation to land utilization in agriculture, the average size of farms in the district, etc.

It may also be of interest to know that the census of 1905 tried to bring out the facts on the number of separate strips of land belonging to each farm. The results are tabulated in Table 15 in the usual manner, and illustrated by a map. The question relating to this subject was drafted somewhat inaccurately, and the Statistical Office states expressly that the returns may contain some errors.

One earlier attempt to ascertain the number of farms in Switzerland could be presented, although the method used was very inadequate. It was based on the returns of the population census.\* The number of people who were returned by the census as "working for their own account in agriculture" was considered as representing the number of farms. Two maps in Vol. 3 of the population census of 1888 illustrate the results. A similar method was employed in 1920, when the prevailing size of farms in a district was worked out by establishing the relationships between the total number employed in agriculture in a certain district and the number of independent farmers. It was assumed that where the percentage of people employed as laborers is the highest, the farms are the largest. A comparison of the map in Schweizerische Industriekarten (p. 21) with the map illustrating the average size of farms in 1905 shows at once that the results differ very much. The method, therefore, does not seem to give satisfactory results.

Care was taken to define the farm more clearly in the census on enterprises in 1929. In the instructions, the definition of the farm is worded as follows:

1. "Each enterprise with more than 25 ares of land used for agricultural production, for forestry or for gardening, even if the products derived from it are not sold but are used for home consumption."
2. "Each enterprise with less than 25 ares of land if
  - (a) it is an independent business in wine-culture, fruit production, truck gardening, gardening and flower gardening.
  - (b) If in the enterprise, livestock (cows, hogs, bees, silk worms, etc.) is kept for business purposes (livestock or livestock products produced for sale).

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\* See: Section E.



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3. "Each enterprise without any agricultural land if livestock is kept for business purposes (for example, hogs for fattening or breeding, poultry, bee hives) and not merely for pleasure.

From this description of the farm, it will be seen that the principal criterion is the "production of food as a business" combined with "land in cultivation." Thus cheese factories, for example, where the fattening of hogs is only a sideline, are included as an agricultural enterprise. Such enterprises, however, are required also to fill in a blank used for the enumeration of industries. The method of tabulation of the returns will determine to what extent comparisons can be made with the farm census of 1905, and with the results of the farm censuses taken in other countries.

The instructions also contain definitions concerning fisheries. An enterprise exists if "the catching of fish is done as principal occupation in creeks, rivers and lakes," or if "fish are hatched and fattened in ponds or other enclosed waters."

The 1930 census in the United States considered as a farm all the land which was directly farmed by one person, either by his own labor alone, or with the assistance of members of his household, or hired employees. A partnership was also considered a farm. A single tract of land or a number of single tracts, even though held under different tenures, could constitute a farm. When a landowner had one or more tenants, renters, croppers, or managers, the land operated by each was considered a farm. No tract of land of less than 3 acres was to be reported as a farm, unless its products in 1929 were valued at \$250 or more.

Several changes have been made from time to time in the definition of a farm in the United States. In 1910 and 1920, for example, tracts of less than 3 acres were included, even if farm products worth less than \$250 were produced, provided the continuous services of at least one person were required for their agricultural operation. In 1900, market, truck and fruit gardens, orchards, nurseries, cranberry marshes, greenhouses and city dairies were not included as farms, unless the entire time of at least one individual was devoted to their care. In 1870, 1880 and 1890, no farm of less than 3 acres was to be reported, unless \$500 worth of produce had been actually sold from it during the year.

Swiss definitions emphasize the use made of the land, whereas United States census definitions place emphasis on the operating units. The Swiss are primarily interested in separating agricultural enterprises (farms) from other types of enterprises (industrial, etc.) The reason for this is due largely to the fact that the agricultural census in

Switzerland is one part of a census of enterprises. In the United States, on the other hand, the agricultural census is, for all practical purposes, a distinct census. Hence, enumerators in Switzerland need to decide what is agricultural, and in the United States what constitutes a farm operating unit.

The definition of a farm proposed as a standard for a world agricultural census by the International Institute of Agriculture is as follows:

"A farm, for census purposes, is all land used wholly or partly for agricultural or livestock production, that is operated, directed, or managed by one person, alone or with the assistance of others, without regard to ownership, title, size or location, and may be in one or more separate pieces, if they are in the same neighborhood and are known and operated as a single holding or property. The person who operates or directs the farm may be owner, tenant, hired manager, or one who <sup>holds or</sup> controls the land and its products under a special form of tenure. In case the farm is operated jointly by two or more persons related or associated together, one of them will be designated to represent his associates as farm operator to supply the census data. The farm may be known as a lot, piece, or parcel of land, garden, orchard, estate, ranch, plantation, rural establishment, proprietorship, or other name, but in any case must be operated, directed or managed by one person. Woodland or forest land that forms a part of the farm or holding and is controlled, directed or managed by the farm operator will also be reported, as well as the plots of ground and buildings occupied and utilized by the laborers employed and living on the farm."

This definition differs little from that used in the 1930 census in the United States, the main difference being no limitation as to the minimum area of farms to be included in the world-census recommendations. A proposal that only farms of one hectare or over, or holdings producing more than \$100 annually should be included was considered by the committee forming the recommendations but was rejected. It was thought that the limitation of value would introduce unnecessary difficulties, and that, as many countries desired to collect information as to holdings of one hectare or less, it was better to remove all limitations.

In the classification of the results by size of holdings, the international committee felt that each country should be at liberty to adopt such size-groups as appear most suitable to its particular circumstances, but for the purposes of international comparison it was desirable that the size-groups chosen should be such as would admit of classification within the following limits:



	1 hectare or less (1 hectare = 2,471 acres)	
above 1	" and up to 5 hectares	
" 5	" " " " 10	"
" 10	" " " " 20	"
" 20	" " " " 50	"
" 50	" " " " 100	"
" 100	" " " " 200	"
" 200	" " " " 500	"
" 500	" " " " 1000	"
" 1000	" " " " 2500	"
	and above	2500

The Swiss classification, given above, is very different, but no doubt could be changed so as to fit in with the recommended classes without loss. Smaller divisions could be made if needed, as long as they came between the limits of the recommended classifications.

The classification which has been used in the United States, with the number of farms so classified in the 1923 census is as follows:

Under 3 acres	15,151
3 to 9 "	363,384
10 " 19 "	588,049
20 " 49 "	1,450,643
50 " 99 "	1,421,078
100 " 174 "	1,383,777
175 " 259 "	503,417
260 " 499 "	438,961
500 " 999 "	143,852
1000 " 4999 "	55,873
5000 acres and over	7,455

A classification in acres of "under 2 1/2, 2 1/2 to 12 1/2, 12 1/2 to 25, 25 to 50, 50 to 125, 125-250, etc." would be about equivalent to the recommended classes. It would fit farm sizes in the United States up to 50 acres and after 250 acres. Above 50 acres a group is needed which will include the 80-acre farms mostly, another that will include the 160-acre farms, another, the 240-acre farms, etc., since most farms in the United States run in fractions of "sections" of 640 acres, and 80's and 160's are the most numerous sizes.

The number of farms reported in the 1905 farm census of Switzerland and in each United States census from 1880 to 1925 are as follows:

<u>Year</u>	<u>United States</u>	<u>Switzerland</u>
1929		221,327
1925	6,371,640	
1920	6,448,343	
1910	6,361,502	
1905		243,710
1900	5,739,657	
1890	4,564,641	
1880	4,008,907	

E. Population of Country; Occupations

Sources listed in Part I are Eidgenössische Volkszählung, 1920; Schweizerische Statistische Mitteilungen, and Statistisches Jahrbuch der Schweiz, together with other publications of the Eidgenössisches Departement des Innern; Beiträge zur Statistik der Schweizerischen Eidgenossenschaft, among other publications listed under Departement des Innern; Schweizerische Statistik 1860-1919, that is, the census data, vol. 1 to 217, and other publications listed under Statistisches Bureau; and Bevölkerung und Arealverhältnisse der Schweiz, published by the Bureau des Bauwesens.

The important other sources of information are:

Handwörterbuch der Schweiz. Volkswirtschaft. Artikel:  
Volkszählungen, Vol. III<sup>2</sup>, p. 1446. Statistik  
(Bevölkerungsstatistik) Vol. III<sup>2</sup>, p. 1843.

Geographisches Lexikon der Schweiz, Vol. 5, p. 1 ff.

The censuses on population are the best statistics available for Switzerland, although here, too, much improvement has been made since they were started in 1850.

There are still earlier figures on population, some from the year 1798, when the newly created Helvetische Regierung ordered a count of the population, the numbers being taken from the registers of the clergy kept in each parish. A second count was ordered in 1837; but two years were used in completing it, which makes the accuracy of the results very doubtful. After the creation of the federal government in 1848, a new enumeration was ordered taken in March 1850, in six days.\* This was a

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\* For the results of this census, see Geographisches Lexikon. The schedules used for these early censuses are reprinted in full in Handwörterbuch der Schweiz. Volkswirtschaft.



real count, the population being enumerated by appointed enumerators. The method was changed entirely for the 1860 census and those following, when the principle of "self-enumeration," or "self-declaration," was introduced. For each family, the head of it had to fill out a blank enumerating the members of his family. The method was again changed in 1888, when a special blank was provided for each member of the family. However, the basic unit remained the "household."

The censuses since 1860 have been based on a law passed in the same year, according to which a census takes place every ten years. Section 2 says the census shall always be taken in December. By decrees of the Federal Council, the date has been fixed for all censuses since 1870 as December 1st. The census scheduled for 1890 was advanced to 1888, in order that the returns might be used as the basis for the new division of the country into section districts, and for legislation concerning accident insurance. The law of 1860 provides further that the schedule for the census is to be fixed by the Federal Council, and that the costs of the census are to be divided between the Federation and the cantons, the Federation paying the general outlays while the cantons pay the expenses of the actual enumeration.

The census taking is organized as follows, the 1920 census being used as an example: Each political commune is divided into census districts, including not more than 250 people, or about 50 families (households), so that one enumerator can collect the census blanks in one day. Before November 10, a very accurate list is made of the number of households in each district, and on the basis of this, the blanks for each household are prepared and put in one cover (Blank No. 4). The number of families does not necessarily coincide with the number of households, for two families living independently in an apartment with others may be considered as constituting one household, the definition of the latter being: "own fireplace and light." Persons simply renting rooms in a family belong to the household. These households are numbered for each census district separately. The enumerator distributes the blanks, together with printed instructions, in the last days of November, and collects the blanks in the forenoon of December 1st. He has to assist the head of the family, who is responsible for the correct statements, in filling out the blanks, and also to ascertain at once if the questions have been answered correctly. He then fills out several blanks designed for the purpose of checking certain returns and obtaining very quickly some preliminary results, as for example, the number of houses in the district, number of households (families), the number of people in permanent residence in the district, and the number of people present in the district during the night of November 30 - December 1. The results are then worked up in a preliminary way for each commune and political district,



and, finally, in detail by the Federal Office of Statistics. The final results have to be formally approved by both houses of the parliament.

The schedule has, of course, undergone many changes since 1860, although it has always been the aim to make the censuses as comparable as possible. Especially in regard to occupations of the population, the definitions have been made more precise, and the classes defined in much more detail. In 1850 one was required only to state one's occupation or industry. In 1860 the equivalent question required one to give the "occupation as precisely as possible, especially to indicate whether performed independently as entrepreneur or foreman, worker, apprentice, skilled worker, etc." Persons engaged in different occupations had to state only the principal kind of work. This applied to all persons over 14 years of age. In 1880 the age limit was fixed at 15 years, in 1888 it was lowered to 14 years again. In both the latter censuses, the name of the enterprise where employed had to be given. In 1900 the important change was made of adding a question concerning occasional occupations, with a view of ascertaining more accurately the total number of people performing agricultural work. In 1910 the question concerning occasional occupations was further expanded to include tenure, whether as owner or tenant or working with one's family. In 1920 the schedule required a statement as to whether the principal or occasional occupation represented home work, and whether on own account or in pay of others or as additional work in the family. The age limit was also abandoned at this time, so that children under 14 years of age were included, a change which probably affected the agricultural population most, for no legal age limits are fixed for performing agricultural work, while factory work is prohibited for children under 14 years of age.

This leads to the more difficult problem of the classification of the different occupations and the definitions involved. The term "occupation" is very widely interpreted. "Principal occupation," for example, means the activity from which the income (labor) principally is derived, or in which people are engaged most of the time. Housework done by the housewife, and school attendance are therefore included as "occupations," although they are not "gainful employments," in the American sense of this term. In applying this definition, the occupations of unemployed people have been recorded. The "occasional occupation" includes any work done, "if it represents a considerable part of the activity during the year (at least one-tenth)." Therefore, at least 30 days have to be spent in the occasional occupation.

The following chart indicates the general scheme of classification used in the Swiss census of 1920.



Total Population.\*

	(	(Independent employees
	(	(Laborers
	(Occupied	(Apprentices
	(	(Family members working in the business
Gainfully	(	(Staff in institutions and inmates of
	(	( institutions who are occupied
employed	(	(Retired or pensioned
	( Not	(Others (no statement as to their
	(occupied	( occupation available)
	(	
	(Working in the	(Occupied (Maids and servants
	( household	(gainfully(
	(	
	(	(Non-family members living in
	(	( the household (not stating
Members of	(Working in the	( Not ( any occupation or gainful
households	( household	(occupied ( employment)
not working	(	(gainfully(Family members
in business	(	( Inmates of institutions
	(	
	(	
	(	
	(Not working in	(Persons not belonging to the family
	( the household	( but living in the household
	(	( (students, etc.)
	(	(Family members
	(	(Inmates of institutions

This classification does not need to be commented upon in detail. Attention should be drawn to the fact that the term "Erwerbende," which was translated as "gainfully employed people," includes some people living upon capital income or property (retired or pensioned people). On the

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\* The discrepancy on p. 87 is explained as follows: On p. 87, the term occupation is used in the sense of activity. It is used in this way on the census schedules in order to obtain the most accurate statements. The returns then are worked up according to the ~~scheme~~ on p. 88, which is not consistent, as explained on p. 88 and 89.

other hand, there is the large class of servants and maids employed in the households, who are not included in "Erwerbende," but classified separately. The argument for this classification is that they are not working in any kind of business enterprise. As in other countries, the Swiss census makes the distinction between professions or occupations and the branches of industry in which these are performed. Eight classes of industries are distinguished, while the number of occupations is more than 200. This distinction is made in order to give a clear picture of the relative importance of agriculture, trade and manufacturing.

The principal classes of industries distinguished are as follows: (A) Production of raw materials and food products, (B) Manufacturing, (C) Trade, (D) Transportation, (E) Public administration and professions, (F) Personal service and occupations not clearly defined, (G) Retired and pensioned people, (H) Persons without gainful employment living in other households.

Agriculture is included in class A. This class again is subdivided into three main classes: (a) Mining, etc., (b) Agriculture, cattle breeding and gardening, (c) Forestry, fisheries and hunting. In class (b), the following special types of farming are distinguished:

Agriculture and cattle breeding  
Wine culture                    )  
Poultry farming                ) if not connected with  
Bee keeping                      ) general agriculture  
Gardening and fruit-tree nurseries

In the usual figures for the agricultural population of Switzerland, those engaged in the first two of the above classes are usually combined, and the remaining classes neglected. This, for example, is done by the Secretariat in Brougg, in compiling the table on agricultural population as published in Statistische Erhebungen 1929 (p.63). The reasons for doing this are rather traditional and can easily be contested.

The population belonging to one of the agricultural groups mentioned above is further subclassified as follows:

- A. Gainfully employed (in agriculture):
1. Independents (owners, tenants and share tenants).
  2. Family members working on the farm (sons, daughters and wives).
  3. Technical staff.
  4. Hired laborers and day laborers.



B. People living in the household but not doing agricultural work:

1. Gainfully employed in the household (maids and servants).
2. Family members working in the household.
3. Other family members living in the household but not doing work in it:
  - (a) adults
  - (b) children

This scheme of classification was adopted in 1888, and the figures of the censuses taken since are, therefore, comparable. The main classification, however, was the same for the two earlier censuses also. The accuracy of some of the figures may be doubted. The classification is, in some respects, vague, and in certain instances the members of the household may have varied much in their classifications of themselves. The Office of Statistics itself suggests that part of the farm housewives may have stated their main occupation as agriculture, and part of them as working in the households. The same was probably done by many daughters of farm families. But these errors affect only the minor results, and have no influence on the total number of persons classified as agricultural.

It is sometimes argued that taking the population census on December 1st causes the agricultural population to be understated since many farm people, as compared with other industries, are working at other occupations at this time of the year. Attention is called to the fact that the 1905 census showed that, in different types of farms, the minimum and maximum number of persons working varied between 69 and 219 percent of the number of people on the farm at the date of the census (August 9). The prevailing system of small farms in Switzerland makes farming during the winter time frequently only a sideline, the main work being home industry or factory work. There seems to be no doubt that the agricultural population as recorded on December 1st is somewhat too small; but probably it is not so much too small as may seem at first.

Unfortunately the 1905 farm census for the enumeration of the population doing agricultural work did not use the same classifications as the population censuses. No distinction was made between people on the farm doing really agricultural work and those working most of their time in the household. A statement had to be made merely as to "the number of persons who are continuously or most of the time working on the farm." The children below 14 years of age were excluded. A total of 745,422 persons was returned. The nearest like figure from the population census is obtained by deducting the number of children from the total agricultural population. For 1900, this result would be 737,441, and for 1910, 669,867. In view of the fact that the trend of the agricultural population was definitely downward at this time, and that the 1905 return



does represent a figure above normal because taken at harvesting time, it would appear that the population census returns are most likely not far from reporting the normal number of people in agriculture.

The schedule for the farm census of August 1929 includes a whole section on farm labor. The instructions are more precise than in 1905. All people not doing agricultural work are excluded from the enumeration, and if they work only part time in agriculture, as for example, housewives, they are recorded in a separate column. (For details, see section F) This classification will be more comparable with the returns of the population census.

The changes in the classifications for occasional occupations in the 1910 and 1920 censuses have been adjusted in the tables for the 1920 census (Statistische Mitteilungen, 1925/I, pp. 4 and 5). As the returns were worked up in the last census, they show the total number of "gainfully employed," as well as "their dependents" who do extra work, for each class of occupations described above. In a further table is indicated in what capacity this extra work is performed, whether as independent, employee, worker, etc.; and in a third table, the occupations for the occasional work are given in very great detail. (For a discussion of the results concerning agricultural labor, see section F).

The classification of the total population into age groups is carried very far by the Statistical Office, and tables are available which make almost every kind of grouping conceivable. The general practice is to make groups by 5-year intervals. Another classification is made according to working capacity: up to 14 years of age, 15 to 59 years of age, 60 years and over. This latter classification was made as far back as the censuses of 1860, 1870 and 1880. Tables by groups of 5 years are not printed for these early years, but can easily be constructed from the tables of age distributions by years.

Much care is also taken to work up age classes of the different occupations. In 1920, for the first time, tables were made for each of the 249 distinct occupations, showing ages for each sex by 5-year groups up to 70 years, starting with the age of 15. The age classifications cannot be traced back by occupations, however, except for the "gainfully employed" in any one branch of industry, as far back as 1900. (Statistische Mitteilungen, 1925/4, p.46). The age groups are by 5-year intervals up to 29 years of age and then by 10-year intervals up to 70 years. There is one group for children below 15 years of age.

In the farm census of 1905, only three age groups were distinguished, namely, 15-19, 20-59 and 60 and over. (For details, see section F).



The analysis of the population returns as to marital status, place of citizenship and place of birth, native language, etc., is made in very great detail, and the schedules have been changed very little. Very detailed results are also available as to the population of the communes. The commune is the smallest political unit in all cantons.

The distinction between urban and rural population is made according to the agreement reached by the "Institute International de Statistique." Communes with less than 2000 people are classified as rural, communes with 2000 and over as urban. This distinction does not mean much for Switzerland. Places with a population of much less than 2000 may be of an absolute urban character (tourist resorts), and places classified as urban may be decidedly "rural."

There are several classifications for the places of 2000 and more inhabitants, the most usual being that all communes with a population of more than 10,000 are called "towns," and the places with more than 100,000 inhabitants, "cities."

Much more significant than the distinction between rural and urban is the distinction between manufacturing and agricultural districts. Three groups are formed: (a) manufacturing districts (agricultural population less than 40 percent), (b) mixed manufacturing and agricultural districts (40 to 59 percent agricultural population)\*, (c) agricultural districts (60 and more percent agricultural population). Tables based on this sort of classification can be found in the introductions to the census volumes.

The final census results are published in several volumes, as can be seen from the bibliography. Special volumes are also printed, containing only the results of individual cantons or of groups of cantons. These appear earlier than the general reports so as to make public the census returns as soon as possible. The final volumes usually contain a very extensive discussion of the census results, and numerous charts, graphs and maps.

The United States census definitions of rural and urban population have varied for different census years. For a time, the population of all places having 8000 inhabitants or over was designated as urban, and the remainder was considered rural. Later, the urban population limit was reduced to 4000, and the remainder was divided into two parts. The first part, which was termed semi-urban, included all incorporated places having less than 4000 inhabitants. The second part, which was termed rural, in-

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\* The official term is "mixed manufacturing and agricultural districts." For a discussion of "rural" see p. 96.

cluded the population living outside any incorporated place whatever.

In 1910 and 1920, the urban population was defined as that residing in cities and other incorporated places having 2500 inhabitants or more, towns of 2500 inhabitants or more in New Hampshire, Massachusetts and Rhode Island being treated as incorporated places, while the remainder of the population made up the rural group. A subdivision of the rural group has been retained under the designation "population living in unincorporated territory." This has been referred to by various writers in recent times as "country population."

In the population figures published in 1910 and following, the classifications adopted in 1910 were carried back to 1880, as shown in Table I; and the early classification has been carried forward in the special monograph on "Farm Population" issued in 1926.

The farm population, as the term was used in the 1920 census, included all persons actually living on farms, without regard to occupation, and also those farm laborers (and their families) who, while not living on a farm, nevertheless live in strictly rural territory, outside the limits of any city or other incorporated place. In the 1925 census of agriculture, however, the farm population was defined as including only persons actually living on farms, without regard to occupation. According to estimate of the United States Department of Agriculture, the number of farm laborers and their families not living on farms, included in the 1920 census of farm population, was approximately 614,269.

In the United States, a "gainful occupation" in census usage is an occupation by which the person who pursues it earns money or a money equivalent, or in which he assists in the production of marketable goods. The term "gainful worker," as interpreted for census purposes, does not include women doing housework in their homes, without wages, and having no other employment, nor children working at home merely on general household work, on chores, or at odd times on other work. Persons gainfully employed in agriculture are those, 10 years of age and over, who are engaged in agricultural occupations.

In Switzerland, as pointed out above, communes with less than 2000 people are classified as rural, communes with 2000 and over as urban. Another classification distinguishes between manufacturing, rural, and agricultural districts, the manufacturing districts being those in which the agricultural population constitutes less than 40 per cent; the mixed manufacturing and agricultural districts those in which it constitutes from 40 to 59 per cent; and the agricultural districts, 60 per cent and over. For the discussion of the Swiss figures, see pp. 89 and 90.



Table I. — CLASSIFICATION OF POPULATION OF THE UNITED STATES AS RURAL  
AND URBAN FROM 1790 to 1920.\*

Year	Total	Urban population	
	population	(1)	(2)
1790	3,929,214	131,472	
1800	5,308,483	210,873	
1810	7,239,881	356,920	
1820	9,638,453	475,135	
1830	12,866,020	864,509	
1840	17,069,452	1,453,994	
1850	23,191,876	2,897,586	
1860	31,443,321	5,072,256	
1870	38,558,371	8,071,875	
1880	50,155,783	11,365,698	14,358,167
1890	62,947,714	18,244,239	22,298,359
1900	75,994,575	25,018,335	30,380,433
1910	91,972,266	35,570,334	42,166,120
1920	105,710,620	46,307,640	54,304,603

\* Farm population of the United States, 1920 by Leon E. Truesdell (Tables 1, 2 and 3).

(1) Places of 8000 inhabitants or more.

(2) Incorporated places having 2500 inhabitants or more.  
(Towns of 2500 or more in New Hampshire, Massachusetts and Rhode Island are treated as incorporated places).

Table I. - CLASSIFICATION OF POPULATION OF THE UNITED STATES AS RURAL AND URBAN FROM 1790 to 1920.\* (Continued)

Year	Rural population		Per cent of total population			
	(3)	(4)	(1)	(2)	(3)	(4)
1790			3.3			
1800			4.0			
1810			4.9			
1820			4.9			
1830			6.7			
1840			8.5			
1850			12.5			
1860			16.1			
1870			20.9			
1880	35,797,616		22.7	28.6	71.4	
1890	40,649,355	35,891,381	29.0	35.4	64.6	57.0
1900	45,614,142	39,312,609	32.9	40.0	60.0	51.7
1910	49,806,146	41,636,997	38.7	45.8	54.2	45.3
1920	51,406,017	42,436,776	43.8	51.4	48.6	40.1

\* Farm population of the United States, 1920 by Leon E. Truesdell (Tables 1, 2 and 3).

- (1) Places of 8000 inhabitants or more.
- (2) Incorporated places having 2500 inhabitants or more. (Towns of 2500 or more in New Hampshire, Massachusetts and Rhode Island are treated as incorporated places).
- (3) Outside incorporated places having 2500 inhabitants or more. (Same as (2) for New Hampshire, Massachusetts and Rhode Island).
- (4) Outside all incorporated places. (Same as (2) for New Hampshire, Massachusetts and Rhode Island).



The term "farm population" includes the number of gainfully employed and their dependents in agriculture (classes A and B, p. 89 and 90), while the term "gainfully employed" includes only class A, excluding, therefore, the gainfully employed maids and servants in the agricultural household. Although in the 1920 census, no age limits were set in collecting data on occupations, the age classification has been worked up in such detail that almost any comparison can be made with other countries.

As can readily be seen, the figures for the United States and Switzerland are highly noncomparable. Furthermore, no very satisfactory methods exist for making the figures for the two countries comparable, except through the acceptance of some common basis of classification. Swiss communes, more or less similar to American townships or counties, are not and cannot be made comparable to incorporated places in the United States. Table II reduces the statistics given for the two countries to the nearest possible basis. The official definition of "rural" in Switzerland is communes with less than 2000 population. This means little, as was pointed out above. It is very difficult to draw the line between rural and urban communes. An analysis of the data shows that the number of communes with a population between 1000 and 2000, which are mostly rural, is relatively small. Therefore in the table a 1000 limit has been worked out. However, the fact that the rural population for Switzerland calculated thus is less than the farm population indicates the unsatisfactoriness of this classification. If the division line had been kept at communes having less than 2000 people, the rural population figure in 1920 would have been slightly more than 1,500,000. But either basis is unsatisfactory, due to the intermixture of urban and rural people in the same commune.

#### F. Farm Labor

Sources in Part I are Schweizerische Statistische Mitteilungen, Eidgenössisches Volkszählung vom 1. December, 1920, and Statistisches Jahrbuch der Schweiz, listed under the Eidgenössisches Departement des Innern; Schweizerische Statistik, vol. 1-217, 1860-1919, and Ergebnisse der Eidgenössische Betriebszählung, listed under the Statistisches Bureau; Publications 1-99, of the Union Suisse des Baysans; Wirtschaftsberichte des Schweizerischen Handelsamtsblattes, published by the Volkswirtschaft Department; and Landwirtschaftliches Jahrbuch der Schweiz.

The returns of the population censuses relating to the agricultural population have already been discussed in section E. Somewhat more detailed explanation is needed in regard to the number of gainfully employed in agriculture, family and hired labor, the occasional labor supply, and migratory labor.

Table II. - TOTAL AND AGRICULTURAL POPULATION OF THE UNITED STATES AND SWITZERLAND

Year	Total*		Rural**	
	United States	Switzerland	United States	Switzerland
1926		3,959,000		
1925	114,553,000			
1924		3,917,800		
1923		3,902,000		
1922		3,891,700		
1921		3,886,010		896,995
1920	105,710,620	3,880,320	42,436,776	899,129
1917		3,887,494		905,152
1916		3,882,859		907,159
1912		3,818,682		915,696
1911		3,785,987		917,830
1910	91,972,266	3,753,293	41,636,997	919,965
1906		3,559,909		932,093
1905		3,516,124		934,774
1901		3,340,984		946,669
1900	75,994,575	3,315,443	39,312,609	949,584
1896		3,151,101		961,315
1890	62,947,714		35,891,321	
1880	50,155,783			
1877		2,785,642		

\* United States - Bureau of Census report for 1880 and 1920 and United States Department of Agriculture estimate for 1925, U. S. D. A. Yearbook, 1927, p.1170.

Switzerland - Census of Population 1900, 1910 and 1920, and official estimates of population for intercensal years.

\*\* United States - Population outside incorporated places - "Farm Population in the United States" by L. E. Truesdell.

Switzerland - Total population in communes of less than 1000 population.



Table II. - TOTAL AND AGRICULTURAL POPULATION OF THE UNITED STATES AND SWITZERLAND. (Continued)

Year	Farm <sup>#</sup>		Gainfully employed in agriculture (15 years and over) <sup>##</sup>	
	United States	Switzerland (1)	United States	Switzerland (1)
1926				
1925	28,981,668			
1924				
1923				
1922				
1921		1,000,601		465,987
1920	31,000,000	1,000,862	10,168,371	465,851
1917		1,001,646		465,148
1916		1,001,907		464,913
1912		1,002,950		463,968
1911		1,003,211		463,731
1910	31,400,000	1,003,472	9,702,319	463,495
1906		1,028,190		464,150
1905		1,035,561		464,297
1901		1,061,073		464,941
1900		1,067,650		465,099
1896		1,094,982		465,750
1890				
1880				
1877				

<sup>#</sup> United States - Farm Census for 1925 and estimate of United States Department of Agriculture for 1910 and 1920. U.S.D.A. Yearbook, 1927, p. 1168. These estimates for 1920 and 1910 do not include an estimated number of farm laborers (and their families) not living on farms, reported in the farm population for these years by the Bureau of Census.

Switzerland - Number of persons gainfully employed in agriculture and their dependents as reported in Census of Population for 1900, 1910, and 1920, and straight line interpolations of intercensal years.

<sup>##</sup> United States - Number of persons, 15 years and over, gainfully employed in agriculture on January 1st, was estimated as

Footnote continued

Table III expresses the foregoing in terms of percentages of the total population.

Table III. - FARM AND RURAL POPULATION OF UNITED STATES AND SWITZERLAND AS A PERCENTAGE OF THE TOTAL POPULATION IN EACH COUNTRY.

Year	United States		Switzerland	
	Farm*	Rural*	Farm*	Rural*
1925	25.2	40.1		
1920	29.3	45.2	26.7	24.5
1910	34.1	51.7	32.2	28.6
1900		57.0		

follows: The 1919 estimate includes one-half of the number of persons 14 and 15 years of age, plus the total number 16 years and over, gainfully employed in agriculture as reported in the census of occupation, less 18,918 persons classified as gainfully employed in agriculture in "other occupations." This figure was obtained by removing poultry raisers and poultry yard laborers from the classification, "other occupations." The 1909 estimate includes the total number of general farmers, dairy farmers, agricultural foremen, gardeners, florists, fruit growers, nurserymen, stock raisers and poultry raisers, 15 years and over, April 15, 1909, estimated as for 1920, plus the same percentage of laborers to the above classes, reported in the Census of Occupation for January 1, 1920.

Switzerland - Census of Population for December 1, 1900, 1910 and 1920, with straight line interpolations for intercensal years.

- (1) Switzerland - Had the apiarists been included in this table, the figures for 1920 would be 335 more for farm population and 172 more for gainfully employed; for 1910, 504 more for farm population and 204 more for gainfully employed; for 1900, 255 more for farm population and 121 more for gainfully employed.

\* See footnotes to Table II for definitions.



In the census schedule of 1920, the answers to question 12 had to be given in such a way that the Statistical Office could work out the classification of the gainfully employed for each of the agricultural industries in the following manner:

Total number of gainfully employed:

- (a) Operators.
- (b) Managers.
- (c) Technical managers.
- (d) Other managerial staff.
- (e) Technical employees.
- (f) Other employees (paid a salary).
- (g) Workers (paid a wage).
- (h) Apprentices.

In a last column of this table is given (see Schweiz. Statistische Mitteilungen 1924-6, p. 38) the total number of people in classes b-h who are members of the family of the operator. This figure is of especial importance to agriculture. The distinction between managers, technical managers and other managerial staff (classes b-d) and the distinction between technical employees and other employees were made for the first time in the census of 1920. They are of no special value for agriculture because of the small-farm system prevailing throughout Switzerland. The few managers reported are employed upon the farms of canning factories and of state prisons, hospitals and similar institutions. The number of apprentices is very small, too, and is made up to a large extent of those in the industry of "gardening and fruit tree nurseries." For each of these classes of gainfully employed (a-h), the number of dependents is given, and another figure indicates the number of foreigners. (For a classification of the operators according to tenure, see section J').

As to the amount of work performed by women in agriculture, no further discussion is necessary. In the tables referred to above, the number of women included in the total is always given separately. It was pointed out in section E that, due to the scheme of classification, there is some uncertainty as to the "principal occupation" of the wives, daughters and housemaids of the farm operators. The large fluctuations in these figures must, most likely, be attributed to this fact,

There are also some difficulties in finding exact information as to child labor. According to the instructions, children of school age (below 14 years) should indicate their occupation as "occasional." In spite of this, 4091 children of 10-14 years were reported as having a "principal"

occupation" in agriculture. The Office of Statistics is of the opinion that this figure does not reflect a true picture. Unfortunately, the "occasionally occupied" are not classified by age groups, and this makes it impossible to find out the total amount of child labor in agriculture and other industries.

Reference has already been made in section E (on population) to the attempts since 1900 to obtain ever more exact figures on the amount of "occasional work" performed not only by the people stating a "gainful employment" but also by those living with them and belonging to their families. These efforts are of special importance for agriculture. A few figures may illustrate this and, at the same time, indicate in what detail the returns were worked up by the Statistical Office in 1920. (See Schweiz. Statistische Mitteilungen, 1925-I). In Table I, the following classification is made: (the figures quoted are those of class Ab (Agriculture)).

1. Total number of persons having a principal occupation.....	470,114
2. Those having a principal occupation who also do occasional work.....	43,071
3. Number of dependents having an occasional occupation.....	44,013
4. Total number occasionally occupied.....	37,084

Figures like these are given for all the 249 branches of industry.

Table 2 analyses the "occasional workers" according to their status while performing this work. The classification reads as follows:

1. Total number of occasionally occupied.
2. Of these having also a principal occupation, the occasional work is performed as (a) independent, (b) employee, (c) worker.
3. Of these having only an occasional occupation, the work is performed as (a) independent, (b) employee, (c) worker.

This table also gives the returns for each kind of industry. It can, therefore, be seen, for example, that out of a total number of 221,302 persons performing occasional work, 111,543 are doing it in agriculture.



But the analysis is carried still further, and Table 3 states the branches of industries in which the persons in each branch of industry are doing their occasional work. For example:

Agriculture and cattle breeding:

Number of principally occupied  
having an occasional occupation 41,061

These do their extra work in the  
following branches of industry:

1. Mining. 31
2. Other branches (about 120  
listed)

The same analysis is also made for the dependents of the "principally occupied." By combining the returns in Table 2 with those in the last table, it is possible to obtain the exact number of the non-agricultural population working occasionally in agriculture. The procedure is to deduct from the total number of persons "occasionally occupied in agriculture" first, those who report agriculture also as their main occupation (doing the occasional work in any other branch of this industry as, for example, wine culture, poultry farming, etc.), and second, women on farms who give household work as their main occupation and agriculture as their occasional occupation. This will show that out of a total of 111,543 persons doing occasional work in agriculture in 1920, only 64,282 are supplied by the non-agricultural population, the bulk of the rest (about 37,000) being members of the farm families (mostly women) or persons living on the farms already classified as agricultural. In all three tables, separate figures are given for men and women, and Table 2 also gives the number of foreigners. The methods of compilation and tabulation of the returns of the 1910 and 1900 censuses were somewhat different, and not so many details were worked out. In spite of this, however, comparable figures can be constructed for at least the main classifications.

It may be of interest to know that the 1920 table containing the age classification of the "gainfully employed" in each branch of industry also gives, for each class, the number of those who are single. Thus, the marital status of the persons engaged in different industries can be compared in detail. The 1910 census did not make this separation, but the 1900 census did.

The returns for farm labor in the farm census of 1905 have already been referred to in section E. The number returned were classified into operators, family members and hired labor. A further distinction was made between managers, employees, wage workers and maids and day laborers. Sex was distinguished, and the age groups 14-19, 20-59, 60 and over. The difficulties of comparing these results with those from the population census

have been explained above, but some minor items, as for example "operators," "managers" and "employees" can be compared, and, with some adjustments, the number of family members and the number of laborers also.

In the farm census of 1929, the schedule is much more precise for farm labor. The operator of the farm has to state his principal, and if, he has one, his occasional occupation. The total amount of farm labor then is classified as follows:

1. Permanent labor.

(a) Operator.

(b) Family members of the operator (wife, sons, daughters).

(c) Other relatives of the operator's family.

(d) Hired laborers.

2. Non-permanent labor (same as b, c, d, above).

Sex is distinguished, and also the number of the laborers below 15 years of age. This schedule is much better adapted to the schedule used in the population census, and better comparisons will be possible of the two returns.

A very interesting question, included in the 1905 farm census schedule, was omitted in 1929. In 1905, the farmers had to state the highest and lowest number of people having worked on the farm during the preceding twelve months. The question relating to migratory workers was also dropped in the 1929 census.

The returns of the 1905 census have been extensively tabulated. The farms have been classified according to the total number of persons working on them; also the number of salaried employees working on them, the number of wage workers and maids, the number of day laborers but no wage workers or maids, and the number of workers and maids and day laborers. In another table, those in each of the foregoing classes working in each farm-size group are classified as to sex, age group, and nationality. The table containing the returns on maximum and minimum employment is arranged as follows: The farms are grouped according to the number working on them at the date of the census. The lowest and highest number reported is expressed in a percentage of the number at the census date. The farms employing migratory labor that comes for a short time only from foreign countries or other parts of Switzerland, are tabulated separately. All these tables give figures for the country as a whole, for each canton and for each district.



The same analysis can be found in the Annex to Vol. 2-2 (Agriculture) where, as already pointed out, smaller size groups are used, and the farms are grouped according to different types.

In the United States, data on the number of persons engaged in different occupations is obtained in connection with the population schedule. Persons engaged in agricultural occupations are classified into three groups designated farmers (owners and tenants), farm managers and foremen, and farm laborers.

In the 1920 census, the following instructions were given enumerators as a basis for classifying persons engaged in agriculture as farmers, farm managers, and farm laborers: "Return a person in charge of a farm as a farmer, whether he owns it or operates it as a tenant, renter, or cropper; a person who manages a farm for some one else for wages or a salary should be reported as a farm manager or farm overseer; and a person who works on a farm for some one else, but not as a manager, tenant, or cropper, should be reported as a farm laborer."

The recommendations of the International Institute of Agriculture are to include as farm labor all persons permanently employed on farms on the date of the census, including the farm operator, his wife, and members of his family actually engaged in farm work. Persons employed principally on domestic or household work should not be included.

For purposes of classification, it was also suggested that all farm labor be classified according to sex, and subclassified into those under 15 years of age and 15 years old and over. In addition, the permanently employed should be divided into two groups - members of the family and other persons.

In addition to the data relating to the number of permanently employed farm laborers, the following questions were suggested for such countries as desire to collect data regarding temporarily employed farm laborers; number of days worked on the farm, hour wages and housing conditions:

- (a) Number of farm laborers temporarily employed on the date of the census.
- (b) Total number of days worked on the farm during the year.
  - (1) By persons permanently employed.
  - (2) By persons temporarily employed.

(c) Customary hours of hired labor per day on the farm.

(1) During the harvest period.

(2) During other periods.

(d) Wages of hired farm labor.

(1) Workers by the day.

(2) Workers by the month.

(e) Housing of hired farm labor and employees. Of the total number of farm laborers and employees on the farm, how many

(1) Occupy a separate dwelling belonging to the farm.

(2) Lodge on the farm.

(3) Live off or independently of the farm.

It will be noticed that the Swiss census recommendations follow fairly closely the practice recommended for the World Census.

The United States census does not attempt to obtain data on temporarily employed farm labor. The date of the enumeration materially affects the number reported as farm laborers, since most persons give as their occupation the one they are following when the census is taken. The collection of information on non-permanent labor circumvents much of this difficulty.

Classification of farm laborers according to sex, nationality, and age groupings are made in the United States. Some of the more significant factors, with data from the 1920 census, are given for the United States and Switzerland in Table IV following.

#### G. Vital Statistics

Sources listed in Part I are Statistische Mitteilungen (1923/1 Die Todesursachen in den Jahren 1911-1920, and 1928/4 Ehe, Geburt und Tod in der Schweiz. Bevölkerung während der Jahre 1901-1920), and Statistisches Jahrbuch der Schweiz, 1891, under Eidgenössisches Departement des Innern; Schweizerische Statistik (Ehe, Geburt und Tod in der Schweiz. Bevölkerung während der Jahre 1891-1900, 5 vol., Ehe, Geburt und Tod in der Schweiz. Bevölkerung während der 20 Jahre 1871-1890, 3 vol., and Geburten, Sterbefälle und Trauungen in der Schweiz, 1867-71) under the Statistisches Bureau, and Beiträge zur Statistik der Schweiz. Eidgenossenschaft, under the Departement des Innern.



Table IV. - FARM LABOR, UNITED STATES AND SWITZERLAND, 1920 CENSUS.

	United States Census	Switzer- land*
Farm laborers, number	4,186,128	259,662
Percent of farm population	13.2	25.9
" " persons gainfully employed in agriculture ten years and over	39.3	55.2
Male farm laborers, number	3,382,899	189,070
Percent of total farm laborers	80.8	72.8
10 to 19 years of age(number	1,246,412	55,859
(percent	36.8	29.5
20 to 44 years of age(number	1,625,023	100,171
(percent	48.0	53.0
45 to 64 years of age(number	398,292	33,040
(percent	11.8	17.5
Female farm laborers, number	803,229	70,592
Percent of total farm laborers	19.2	27.2
10 to 19 years of age(number	340,782	13,991
(percent	42.4	19.8
20 to 44 years of age(number	370,007	35,131
(percent	46.1	49.8
45 to 64 years of age(number	81,037	21,470
(percent	10.1	30.4

\* It is not possible to construct exactly the same table for Switzerland as for the United States because no age classification is given for the classes of gainfully employed as stated on p. 102. The above figures for number of farm laborers, male and female, in Switzerland have been obtained by deducting the number of operators reported from the total number of gainfully employed. Both of these figures probably include some persons of less than 10 years of age. The Swiss figures for farm laborers also include managers and other managerial staff, who are excluded in the United States figures. But their number is very small, as can be seen from the following table:

Number gainfully employed (total)	470,114
(a) Operators	210,452
(b) Managers	9
(c) Technical managers	231
(d) Other managerial staff	66
(e) Technical employees	491
(f) Other employees	856
(g) Workers	256,227
(h) Apprentices	1,732

Footnote continued

The important other sources of information are as follows:

Die Bewegung der Bevölkerung in der Schweiz, 1876 and following.  
(Yearly publication). See also 1880-1917.

Thomann, Dr. H. - Die Bevölkerungsbewegung in der Schweiz.  
Städten mit über 10,000 Einwohner in den  
Jahren 1891-1920. Zeitschrift für Schweiz.  
Statistik, 1922.

Bureau Fédéral de Statistique: La Statistique Suisse des Causes  
de Décès. Zeitschrift für Schweiz. Statistik, 1923.

Handwörterbuch der Schweiz. Volkswirtschaft. Artikel: Be-  
völkerungsstatistik.

The method applied in the construction of the mortality tables is  
dealt with in the following books:

Die Bewegung der Bevölkerung in der Schweiz im Jahre 1878. Schweiz.  
Statistik, No. 45. (See Part I).

Die Sterbetafel 1889-1900. Schweiz. Statistik No. 185. (See Part I).

Die Ergebnisse der Eidgenössischen Volkszählung vom 1. December 1910.  
Vol. II. (See Part I).

Steiner - Stoos, H. - Die Konstruktion der Durrerschen Sterbetafel.  
Zeitschrift für Schweiz. Statistik 1908, Vol. II.

Although data on vital statistics were collected by individual cantons in the eighteenth century, the Federation did not succeed in establishing a regular and uniform statistical service of registration of births, deaths, and marriages before 1867. By that time, a standard schedule had been adopted by nearly all the cantons. The organization of the registration service, however, remained in the control of the cantons. The result of this situation was that sometimes the returns were incomplete or inaccurate. All this was changed in 1876. A new constitution, adopted in 1874, gave the Federation the right of legislation on the matter, and the law which was presently enacted provided for a uniform system of registration throughout the country. The registrars were required to report their registrations directly to the federal office. The reports were expanded as to the causes of deaths and as to divorces.

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It should be noted that, out of the total number listed in classes (b) to (h) 156,240 are members of the operators' families, the number of hired laborers being, therefore, 103,422.



## Firths

According to the law of December 24, 1874,\* the registrar of births, deaths and marriages has to be notified orally within three days of each birth and of each miscarriage which occurs after at least 6 months of pregnancy. The following entries are made by the registrar: date, hour and place of birth; name and surname and sex of the child; name, surname, occupation, place of citizenship and place of residence of the parents; in the case of an illegitimate child, the same for the mother. If it was a multiple birth, each child has to be registered separately.

For death registration, the registrar has to fill out a specially prepared card and mail it to the Federal Office of Statistics. The schedule provides for almost exactly the same entries as just mentioned. Still-born children are recorded in the same way. To secure a uniform classification, the federal law contains a definition of a still-birth. In spite of this, the returns are still somewhat inaccurate as to this detail. For religious reasons, Roman Catholics are inclined to consider still-born children as live-born, with their deaths occurring a few minutes afterwards. In its last report, the Statistical Office expresses the opinion that this practice is being slowly abandoned.

The returns are worked up by the Federal Bureau of Statistics. The yearly publication contains merely the major results. The results of the more extensive analysis are published in more elaborate tables, in reports covering longer periods. Here will be found worked out the rate of birth per 1000 population, the rate of birth per woman of child-bearing age (15 to 49 years of age), and per married woman of that age, the number of children born in relation to the number of weddings in the same year. Furthermore, there is an attempt made to work out a standard fecundity coefficient, taking the fecundity coefficient of the women below 25 years as a unit. Comparisons are made, in terms of these coefficients, for citizens and foreigners, for rural and urban population (urban here interpreted as all places with 10,000 and more inhabitants). Also the 187 districts of the country are classified into agricultural, mixed agricultural and industrial; into Roman-catholic and Protestant, French, German, Italian and Romantch; and coefficients for these groups of districts, and of combinations of them, are worked out. The same analysis is carried through for the number of illegitimately born and for the still-born. Additional tables deal with the number of illegitimates who have been legitimated by the subsequent marriage of their parents, the ratio of the sexes at birth, and of the multiple births. Finally, there are tables

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\* See also Decrees of the Federal Government of February 25, 1910 which were replaced by the decree of May 18, 1928.



worked out on the distribution of births by months.\*

### Marriages and Divorces

Compulsory civil marriages were introduced into Switzerland in 1876. Since then, their registration has been uniform throughout the country. This has also made possible the collection of complete and accurate data for statistical purposes. The number of marriages in each canton and in each district, the citizenship of the married couples, and the distribution of the weddings by months are tabulated in the yearly publications. As in the case of births, the analysis for longer periods goes into great detail, developing various coefficients of marriages in relation to total population, and in relation to men and to women of marriageable age. The marrying people are classified according to their age and to their marital status (single, divorced or widowed).

Statistics on divorces were started with the introduction of federal legislation on that subject in 1876. The analysis of the returns is carried out on the same lines as that of the other vital statistics. Some tables may be of special interest, as for instance, that which shows the number of years the people were married before their divorce, and especially those in which the legal causes of complaint and the party which brought the action are analyzed.

### Deaths and the Causes of Deaths

The law of 1879 requires that the registrar be notified orally within 48 hours of each death occurring in the commune. Completeness and reliability are therefore assured for the registrations as well as for the statistics of them. The yearly publication contains the returns for each district, the rate of deaths per 1000 population for each canton, a classification of the deaths according to age groups for the whole country, for each canton and each town (towns with 10,000 and more population), and the number of deaths occurring in each month of the year. Much more detailed information can again be found in the periodical analysis of the returns by the Federal Bureau of Statistics. Besides the usual death-rate figure, the Bureau is also working out a "standard death rate," which is obtained by multiplying the average number of people in the different age groups as returned by the population censuses 1880-1920 by the ordinary death-rate of each of these age groups in each census year. In this way, the influences of increases or

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\* The distribution of birth by months is recorded as follows:

January 78,120  
February 76,209, etc.

There are other tables computed in the following way: The average daily number of births in a year is taken as 100 and the average daily number of each month is expressed in per cent of this; e.g.,

1901	Jan.	Feb.	Mar.	Apr.	Oct.	Nov.	etc.
	96	104	107	103	96	96	



decreases of the population are eliminated and the trend in the death-rate is shown more exactly. The further analysis of deaths by age groups, sex, urban and rural, industrial and agricultural population, etc. is carried through as outlined in the section on births. In addition, the Bureau has worked out frequency tables on mortality.

In the mountainous cantons, statistics on the causes of deaths are not as complete and accurate as those just discussed. The law does not make the certification of a death by a physician compulsory. The number of deaths for which certificates were available increased, however, from an average of 81.5 per cent in 1876-80 to 97.6 per cent in the years 1916-1920. Most of the deaths for which medical certificates are still missing occur in the mountainous cantons.

The certificate\* provides for information on the immediate cause of the death as well as the major illness from which the person was suffering. The statistical Bureau has encountered some difficulties in obtaining this information correctly, and only the data obtained since full accuracy in regard to the statements of the physicians was assured in 1901 can be considered as sufficiently accurate. The list of diseases included 205 classes at first, and later on, 320. These returns also are analyzed yearly in detail, at least for the major diseases, especially as to age, sex, place of residence, frequency of deaths from certain causes in each month, etc. Less detailed in their analysis, but more complete from the point of view of the actual number of deaths due to each individual disease, are the tables in the separate publications on "the causes of deaths." (See the Volumes 1871-90, 1891-1900 and 1900-1920. For the years 1901-1910, see *Statistisches Jahrbuch der Schweiz*, 1912.)

The U. S. Bureau of the Census keeps records and publishes reports of the mortality of those parts of the United States where the statistics are sufficiently accurate to make it worth while to do so. A so-called registration area for deaths was established in 1880. This included those states and cities in which satisfactory registration laws were being effectively enforced, and where there was good reason to believe that more than 90 per cent of all deaths were being registered. At first the registration area included only two states, Massachusetts and New Jersey, and certain cities in other states. The area has gradually expanded from 0.6 per cent of the total land area of the United States in 1880 to 74.7 per cent in 1926. In 1880, 17 per cent of the total population was included as compared with approximately 90 per cent in 1926.

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\* For a reprint of the schedule used, and a detailed description of the method used in securing the statistical information, see "Zeitschrift für Schweiz. Statistik," 1923, p. 159.

A registration area for births was not established until 1915. The birth statistics published in connection with the regular decennial reports from 1850 to 1900 inclusive were based on census enumerators' returns. The registration area in 1915 included only 15 states. In these states, the registration of births was believed to include upwards of 90 percent of the total numbers. This registration area included only 10 percent of the area and 31 percent of the population of the country. Other states were gradually added until, in 1926, the birth registration states numbered 35.

There is no uniform marriage or divorce law in the United States, and state laws differ greatly. In the case of marriages, the custom is for the person officiating to register the marriage. Persons desiring to marry must first obtain a civil license from a designated local official and present it to the authorized person who performs the ceremony. The persons responsible for marriage registration are, therefore, the clergymen and the justices of the peace. Records of divorces are obtained from civil courts that grant the decrees.

Following are given the major statistics of deaths, births, and marriage and divorce for the United States, as published in the "Abstract of the Census," and for Switzerland.



Table V. - NUMBER AND RATES IN ENTIRE DEATH REGISTRATION AREA OF CONTINENTAL UNITED STATES\* (1900-1925) AND SWITZERLAND (1900-1929).

Year	Registered area				Percent of total	
	Population		population			
	United States	Switzer-land**	United States	Switzer-land		
1900	30,765,618	3,299,939	40.5	100		
1905	34,052,201	3,515,789	40.4	100		
1910	53,831,742	3,739,789	53.3	100		
1915	67,095,681	3,822,829	67.5	100		
1920	87,486,713	3,876,922	82.2	100		
1925	103,108,000	3,936,330	89.4	100		
1929		4,052,200		100		

Year	All deaths		Deaths under 1 year of age		Death under 5 years of age	
	Rate per 1000 population		Percent of all deaths		Percent of all deaths	
	United States	Switzer-land	United States	Switzer-land	United States	Switzer-land
1900	17.6	19.3	20.7	22.2	30.4	29.7
1905	16.0	18.6	19.3	19.7	27.0	25.9
1910	15.0	15.1	19.2	17.4	27.0	23.0
1915	13.6	13.2	16.3	13.2	22.4	19.9
1920	13.1	14.4	15.3	13.2	21.7	16.4
1925	11.8	12.2	15.3	8.8	17.9	11.9
1929		12.4		7.1		9.6

\* Exclusive of still births.

\*\* Midyear estimate.

Table VI. RATES OF BIRTHS AND DEATHS TO TOTAL POPULATION IN BIRTH REGISTRATION AREAS OF THE UNITED STATES AND SWITZERLAND

Year	Population of registration area*		Rate per 1000 population	
			Births	
	United States	Switzerland	United States**	Switzerland
1917	54,771,416		24.7	18.6
1918	55,515,241		24.6	18.7
1919	61,483,423		22.3	18.5
1920	63,659,441	3,876,922	23.7	20.7
1921	70,425,705		24.3	20.8
1922	78,885,852		22.5	19.6
1923	79,952,425		22.4	19.4
1924	85,424,653		22.6	18.8
1925	87,636,000	3,936,330	21.4	18.4
1926	89,988,000		20.6	18.2
1927				17.4
1928				17.3
1929		4,052,200		17.0

Year	Rate per 1000 population		Excess of births	
	Deaths			
	United States	Switzerland	United States	Switzerland
1917	14.2	13.7	10.5	4.9
1918	18.3	19.3	6.3	0.6
1919	13.0	14.2	9.3	4.3
1920	13.1	14.4	10.6	6.3
1921	11.7	12.7	12.6	8.1
1922	11.9	12.9	10.6	6.7
1923	12.4	11.8	10.0	7.6
1924	11.8	12.5	10.8	6.3
1925	11.8	12.2	9.6	6.2
1926	12.2	11.7	8.4	6.5
1927		12.3		5.1
1928		12.0		5.3
1929		12.4		4.6

\* Midyear estimates.

\*\* Exclusive of still births.



Table VII. - RATIO OF MALE TO FEMALE BIRTHS AND DEATHS, AND RATIO OF TOTAL MALE AND FEMALE DEATHS UNDER 1 YEAR PER 1000 BIRTHS IN BIRTH REGISTRATION AREAS OF THE UNITED STATES AND SWITZERLAND

Year	Population of (1) registration area		Number of males per 1000 females Births	
	United States	Switzer-land	United States	Switzer-land(2)
1917	54,771,416		1058	1050
1918	55,515,241		1058	1062
1919	61,483,423		1057	1050
1920	63,659,441	3,876,922	1057	1071
1921	70,425,705		1059	1055
1922	78,885,852		1056	1059
1923	79,952,425		1057	1060
1924	85,424,653		1058	1043
1925	87,636,000	3,936,330	1060	1052
1926	89,988,000		1057	1049
1927				1067
1928				1053
1929		4,052,200		1039

Year	Deaths under 1 year of age per 1000 births (3) per 1000 females:		Deaths under 1 year of age per 1000 births (3) per 1000 males:	
	United States	Switzer-land	United States	Switzer-land
1917	1200	1029	94	79
1918	1158	1101	101	88
1919	1123	948	87	82
1920	1101	974	86	84
1921	1109	1010	76	74
1922	1130	961	76	70
1923	1139	1029	77	61
1924	1169	998	71	62
1925	1168	1004	72	58
1926	1170	1005	73	57
1927		990		57
1928		1021		54
1929		1032		52

- (1) Midyear estimates.
- (2) Inclusive of stillbirths.
- (3) Exclusive of stillbirths.

Table VIII. - MARRIAGES AND DIVORCES: NUMBER AND RATIO OF DIVORCES TO MARRIAGES IN CONTINENTAL UNITED STATES AND SWITZERLAND

Year	Number of marriages		Number of divorces per 1000 Marriages	
	United States	Switzerland	United States	Switzerland
1890	542,537		62	
1895	598,855		67	
1900	635,284		81	
1905	804,787	26,272	24	46
1910		27,346		53
1915		19,527		75
1916	1,040,684		108	
1920		34,975		64
1922	1,134,151		131	
1925	1,138,334	28,110	148	79
1929		31,238		87



## H. Land Utilization

Part I lists, as sources, Beiträge zur Statistik der Schweizerischen Eidgenossenschaft, under Departement des Innern; Schweizerische Statistik, vol. 1-217, 1860-1919, Eidgenössische Betriebszählung, 1905, Anbaustatistik der Schweiz, 1917, and Schweizerische Arealstatistik under Statistisches Bureau; Schweizerische Statistische Mitteilungen and Statistisches Jahrbuch der Schweiz, under the Eidgenössisches Departement des Innern; Rapport sur le Commerce et l'Industrie de la Suisse, under Union Suisse du Commerce et de l'Industrie; Statistiques et Évaluations Agricoles, under Union Suisse des Paysans; and Bevölkerung und Arealverhältnisse der Schweiz, under the Bureau des Bauwesens.

Certain of the statistics by cantons are also of value in connection with land utilization:

Statistische Mitteilungen betreffend den Kt. Zürich, Heft 108.  
Landwirtschaftliche Statistik des Kt. Bern 1885-1927.  
Vaud-Statistique Agricole 1895-97.

Other sources of information are as follows:

Schweiz. Alpstatistik, herausgegeben vom Schweiz. Alp-  
wirtschaftlichen Verein, 1914.

Handwörterbuch der Schweiz. Volkswirtschaft, Artikel:  
Getreidebau,  
Futterbau,  
Weinbau,  
Alpwirtschaft,  
Forstwirtschaft,  
Landwirtschaft.

Volkswirtschaftslexikon der Schweiz.

Volkswirtschaft, Arbeitsrecht und Sozialversicherung der  
Schweiz, 1925, vol. I.

Two different kinds of land surveys have been made in Switzerland so far. In 1912 and 1923-24, data were collected on the total area of the country, but the land itself was classified under only two major headings.

In the census of 1905, and the three censuses of 1917, 1919 and 1926, however, an effort was made to obtain more detailed information with regard to the use of the land for different crops.

The basis of the census of 1923-24 is the smallest political unit known in Switzerland, the commune. There are 3129 of these units, to which must be added a number of tracts which belong either to two or more communes or directly to the canton. Some of the communes have their land in two or more pieces; and 9 out of the 23 cantons have their area thus divided. It must also be explained that one of the communes (Illens) comprises only one dwelling, others include only a few dwellings, but some include several villages or even a town with surrounding villages. The altitude of the commune was taken as at the central point of the places of residence of the population living in the commune. Lakes of a size over 1 square kilometer were counted separately, and all the smaller lakes were assigned to the adjacent communes.

As regards the land classification, the communal authorities were asked to give accurate data on "land in forests," "land in use for agricultural production" (including the mountain pastures, and all land used for gardening), and "unproductive land" (land used for dwellings, streets, railways, etc.\*)

The communes had to use the cadasters as a basis for this information. By the law of 1907, in force since January 1, 1912 (Code civil art. 950, art. 38 of the introductory provisions and decree of the Federal Government of December 15, 1910), every commune has to be surveyed before 1976. The work is progressing very slowly, and by 1923 only 1905 communes had been surveyed completely. Of these, only 949 surveys are considered satisfactory by the Federal Government. In 797 communes, the survey had not yet been started by that time. The results obtained, therefore, can not be considered as absolutely correct.#

\* No detailed definition of "productive" or "unproductive" land is revealed in the introduction to the census figures. It is, therefore, impossible to know whether marsh land, for example, was classified as productive or unproductive. As regards the definition of the "woodland," the classification used by the Swiss Forest Bureau was applied. In spite of this, the forest area as revealed by the census is about 79,000 hectares smaller than the area classified as forest land by the Swiss Forest Bureau for 1924. (Compare Statistisches Jahrbuch der Schweiz, 1924, page 3 with page 109)

# The present state of the work is as follows (Sept. 1930):

Completely surveyed	19.07	percent	of	total	area
Survey in progress	8.08	"	"	"	"
To be surveyed	<u>66.48</u>	"	"	"	"
	93.63	"	"	"	"
Not being surveyed (in the same detail)	6.37	"	"	"	"
					(lakes, glaciers, rocks, etc.)



The census was conducted by the Federal Office of Statistics. The results obtained from the communes were compiled for the larger political units (the districts and the cantons), and then verified by the cantonal authorities. They were published in Table I for the country as a whole and the different cantons, in Table II for the districts, and in Table III for the communes. As regards the land classification, not all three tables reveal the same detailed data. Figures on the following classes of land can be found throughout: total area, productive area without wood, woodland, unproductive area. In addition, Tables I and II contain figures on the area in lakes of over 1 square kilometer, and the productive and unproductive area without lakes of over 1 square kilometer. In Table III is indicated the kind of land survey already made in each commune, and the altitude in meters above sea level is quoted. The unit of measurement in all tables is the hectare.

The earlier census in 1912 was made in the same way by the Federal Office of Statistics. At that time the data obtained from the communes were to a still larger extent only estimates, for the survey work was very incomplete. But the returns of the communal authorities have been repeatedly checked against the maps made by the Bureau of Topography, which has not only brought out mistakes in the returns of the census data but also errors in the maps. Moreover, in two cantons, the public domain was not included in the survey. This latter mistake is corrected in the census of 1923. In comparing in detail the figures of the 1923 census with those of the census of 1912, one must also know that exchanges of territory between communes take place very frequently. Quite a number of re-consolidations of farms have also affected the area of the communes, and in some cases, the area of the districts and even of the cantons.

Still more incorrect are the figures given in the statistical year-books from 1891 up to 1918. These vary sometimes from year to year on account of better information received by the Federal Government from the cantons. The original figures for these reports were collected in 1877. They are more detailed than those of the censuses of 1912 and 1923 in that the productive land was separated into (a) woodland, (b) vineyards, and (c) arable land, which included pastures and meadows and gardens. The unproductive land was classified as follows: glaciers, lakes, towns, village and other land used for buildings, rivers and creeks, railways and streets, mountains and other unproductive land.

A similar census was taken by the Canton Zürich in 1910. The classification of land was the same as in the federal censuses of 1912 and 1923. The results are published in detail for each commune. The unproductive land is classified separately under the following items:

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Source: Paper read by J. Baltensperger, Chief, Federal Bureau for Land-Surveys, at the International Conference of Geometricians in Zürich Sept. 1930.



1. Streets of first and second class order	= 0.9%
2. Local roads, fieldways and footpath	= 2.1%
3. Railways	= 0.6%
4. Area used for buildings and yards, including the gardens in the city of Zürich (which were considered as unproductive. Gardens outside of Zürich were considered as productive).	= 1.7%
5. Creeks, rivers, ponds, etc.	= 0.8%
6. Public gardens and squares, fields for gymnastic exercises, cemeteries, loam pits and gravel pits, open store* and working places, quarries, etc.	= 0.4%
	-----
Total unproductive	= 6.5%

The data of items 4 and 6 are based on estimates, no accurate maps being available. The figures for item 1 were furnished by the Street Department, those for rivers, creeks, ponds and lakes by another government office, and the figures for railways by the Swiss Federal Railways and the other railroad companies. The area for item 2, 4 and 6 was obtained by investigations with the local authorities.

The first Federal attempt to obtain more detailed information on the use of the land for different crops was made in the farm census of 1905. As already pointed out (see section D), the enumeration of the area was limited to the farms with a minimum amount of 1/2 hectare of land. As a result of this limitation, a considerable area of cultivated land was not recorded, especially land in vineyards.

The method followed in taking this census was briefly as follows: Schedules were distributed to the farmers to be filled out by them. The "Enumerators" merely had to collect them and to give advice and assistance when it was asked for by the farmers.

Reviewing the results as to the amount of land in farms, the Federal Office of Statistics points out that the question as to land in farms in the schedule was often answered inaccurately, either unconsciously or consciously. When the returns of the farmers were obviously

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\* Open store = Lagerplatz = place used for open storage of wood, timber, bricks, etc.



wrong, they were asked to correct the figures. Some returns were also corrected by the communal authorities. The errors in the farmers' reports are partly attributed to inclination to give minimum figures, or to inability to give the correct figures, owing to the incompleteness of the survey. A further cause of error was that the old units of land measurement were still in use by the farmers, although the metric system was introduced legally as far back as in 1877. The figures on the area of pasture land on the mountains are especially considered to be much too low.

The classification of the land also was somewhat inaccurate. The instructions to question No. 12 on the schedule read in part as follows: "Every piece of land belonging to the farm, regardless of its situation, must be enumerated, giving the acreage in hectares or in the old measures. Artificial grass land must be counted as meadow if grass seeding predominates." Other grass land (clover, lucerne, etc.) was counted under arable land.\* Pasture land was defined as being the land which is used only for pasturing. This means that any land which is cut for hay at any time during the year was counted as meadow, even though pastured most of the year. The practice is common in Switzerland of both pasturing and cutting grass for hay on the same land. Permanent land in grass (hay) was called meadow. Thus the following list of classes of land was set up: (1) meadow (natural and artificial), (2) pasture land, (3) arable land, (4) gardens, (5) vineyards, (6) woodland, (7) marshland. An additional question asked for the acreage of the arable land used for production of cereals. No further indication is given as to what kinds of cereals were included under this item. Table 16, of Volume 2/2, gives the results by cantons and districts. The records of the individual communes have never been published, and cannot now be worked out, since the original census blanks were destroyed recently. A sample of the census schedule, in its German and French edition, is included in this volume.

The total area of land in farms included in the census amounted to 2,088,376.55 hectares. In this figure is included the woodland on farms amounting to 200,933.89 hectares, the land really used for agricultural purposes being, therefore, 1,887,442.66 ha. In the census of 1912, the productive area (without forests) was recorded as being 2,321,238 ha. Thus there are about 433,895 ha. of productive land not recorded in the 1905 census, due, as already explained, to the omission of the enterprises of below 1/2 hectare, as well as to the omission of acres not used for agricultural purposes, as for example, turf land, and to the inaccuracy in the returns for pasture land in the mountains.

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\* "Arable" according to the terminology adopted by the world census: arable = plowed land (see p. 122 ).



The error concerning mountain pasture land can be checked somewhat by comparing the census returns of 1905 with the results of other attempts to collect statistics on the mountain pastures, the first of which was made in 1864 and conducted by the Swiss Statistical Office in collaboration with the Schweiz. Alpwirtschaftlicher Verein, an organization for improving the mountain pastures. The definition of pasture land was the same as used later in the census of 1905, namely "land used exclusively for pasturing." It excluded, therefore, all land on the mountains where any grass was cut for hay. It likewise included land in the plains country "exclusively used for pasturing." The returns were very incomplete, only 340 out of 4559 enterprises returning the area of the land, and even these not being uniform. No indications were given whether woodland was included or deducted from the total area. The area was stated in the old measure of the "Jucharts" (about an acre) and "Quadratruthen." The schedules in this census were filled in by the owners of the "Alps," which is the term commonly used in Switzerland for mountain land.

The Alpwirtschaftlicher Verein started another enquête in 1891. The results of this have been published separately for each canton, and are summarized in the final volume of the Schweiz. Alpstatistik, published in 1914. They may also be found in the Statistisches Jahrbuch der Schweiz, 1924, p. 108 (or other years). The pasture land of several cantons is not reported, which leads to the conclusion that only mountainous pasture land was included. The results of this census compare very closely with the results of the 1905 census, in spite of the differences in the method of securing them.\* The total area of pasture land was reported, in 1905, as being 687,540 hectares. The inquiries of the "Alpwirtschaftlicher Verein" showed an area of productive pasture land of 673,066 ha. This difference can be explained by the omission in the latter census of the pasture land in the level country. The total area of these mountain pasture farms, however, (unproductive as well as productive) was reported in the 1891 inquiry as being 1,134,777 hectares. Taking this latter figure would increase the "farm area" by adding about 500,000 hectares of absolutely unproductive land (rock, glaciers, etc.)

In the census of 1905, the forest enterprises were recorded on a separate schedule, which was prepared by the Schweiz. Oberforstinspektorat, which had charge of this part of the census. Schedules were sent to the forest services of the cantons, which acted as enumerators. The returns

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\* The Alpwirtschaftlicher Verein appointed enumerators who visited each farm and took records according to uniform instructions.



were made by the individual owners, supervised and verified by the local forest service officials. The tabulation of the results was made by the Federal Bureau of Statistics, and published as Part II of Vol. 2/2 (Agriculture). A sample of the schedule is included at the end of the volume.

Question 5 of the schedule deals with the acreage of forest land. Four different kinds of forests and forest lands have been recorded:

1. Niederwald (bushes).
2. Mittelwald.
3. Hochwald.
4. Other forest land, as for example, nursery land.

The total acreage was found to be 632,848 hectares. Adding 200,934 hectares of woodland recorded in agricultural enterprises to this gives a total forest area of 833,782 hectares. The forest area ascertained in the same year by the Schweiz. Oberforstinspektorat was larger by about 44,707 hectares. This is explained by mistakes in the census returns as well as by possible mistakes made by the Oberforstinspektorat. This office obtains the acreage of the woodland from the maps, if no exact surveys are available, and these maps are a very unreliable source, especially with regard to the acreage of woodland. (For other differences in returns on woodland in other censuses, see p. 117). The tables as compiled from the 1905 census give the area by class of woodland forests and by cantons. (See Table II)

The recommendations for a world agricultural census include the following classifications under the general heading "farm area":

(1) Total area in farms.

(2) Arable land.

All cultivated land, fallow land, and artificial meadows, plowed in the census year or in one of the preceding four years. Not to include land under orchard or bush fruits, trees or shrubs.

(3) Permanent meadow and pasture.

Land used permanently or during the last five years for the growing of perennial or long-lived herbaceous forage crops. Permanent meadow and pasture in which trees and shrubs are grown, as well as woodland meadows and pastures, to be included only when the growth of forage crops thereon is the chief object.

(4) Lands for growing trees and shrubs.

Orchard lands used for growing trees and shrubs, such as are not included under the heading of wood and forest lands.

(5) Wood and forest lands.

Lands covered with forest trees, the chief importance of which lies in their timber and forest products.

(6) Productive marshlands, heathlands and other productive but uncultivated lands.

(Uncultivated lands not included under the preceding headings, producing some kind of utilized vegetable product).

The Swiss practice in contrast, as pointed out above, has been to divide the total farm land into seven classes.

(1) Meadow land.

(Natural and artificial)

(2) Pasture land.

(Land used only for pasturing)

(3) Arable land.

(4) Gardens.

(5) Vineyards.

(6) Woodland.

(7) Marshland.

The land classification used in the 1929 census is much more detailed than that of 1905. This makes an accurate classification as outlined by the International Institute of Agriculture possible (see p.146-147).

In the 1930 United States Census, provision is made for classifying the total farm acreage as follows:

(1) Crop land.

(a) Land from which crops were harvested in 1929.

(b) Land from which no crop was harvested in 1929 because of crop failure or destruction.

(c) Crop land idle all of 1929 or land in summer fallow in 1929.

(2) Pasture land.

(a) Land used only for pasture in 1929 which could be plowed and used for crops without clearing, draining or irrigating.

(b) Woodland used for pasture in 1929.

(c) All other land used for pasture in 1929.



(3) Other land.

(a) Woodland not used for pasture in 1929.

(b) All other land.

(Includes all waste land not in forest, pasture, or crops. Includes also houseyards, barnyards, feed lots, lanes, roads, etc.)

In 1920, the census bureau classified farm land into three groups: (1) improved, (2) woodland, and (3) other unimproved land. Improved land included all land regularly tilled or mowed, land in pasture which has been cleared or tilled, land lying fallow, land in gardens, orchards, vineyards, and nurseries, and land occupied by farm buildings. Woodland included all land covered with natural or planted forest trees which produce, or later may produce, firewood or other forest products. Other unimproved land included brush land, rough or stony land, swamp land, and any other land which is not improved or in forest.

The same classifications were made in 1910, but the definition of terms varied somewhat. Improved land, for example, included "land in pasture which has been cleared or tilled" in 1920, and "land pastured and cropped in rotation" in 1910. Obviously, these phrases are not synonymous. The definitions of "woodland" and "other unimproved land" were the same, but doubtless much land which was considered improved according to the 1920 definition was not so listed in the 1910 census.

In 1900, only two classifications of farm land were made: (1) improved and (2) unimproved. Improved land was defined as in 1910, while unimproved included both woodland and other unimproved land.

The classification "improved land" was dropped in 1920 because it was not based on use of land, like the others, and hence cut across them, and because of difficulties of applying any kind of definition to it.

The classification of "arable" has never been used officially in the United States. A figure roughly comparable to it can be devised by subtracting from "crop land" the "acreage in wild grasses cut for hay," in the 1925 and 1930 censuses. No doubt some of the "idle" crop land included in this classification is not merely temporarily idle. On the other hand, there should be added to it the land that is being used for pasture in rotation with crops. But no figure is available for this. The "plowable pasture" classification includes considerable pasture not in rotation.

Adding plowable pasture to crop land might give a figure not greatly in excess of the true arable for the United States; but such a practice

could not be followed in a country such as England where a large acreage of cultivable land is kept in grass. The safest procedure for the United States would be to use crop land less acreage in wild grasses cut for hay.

"Agricultural land" is a classification that probably comes nearer to giving comparable figures than any other that can be devised. Applied to the United States census classification for 1924, it would include "land in farms" less "woodland not used for pasture," less "all other land in farms." It should include a large fraction of "woodland pasture"; but no basis is available for indicating how large a fraction. But to offset this, a part, perhaps a half, of "all other land in farms" consists of land in lanes, farmsteads, feedlots, and other really agricultural uses. The acreage of "all other land in farms" amounts to about nine acres per farm; if one half of this acreage is agricultural land, this will represent about one third of the acreage of "woodland pasture", which probably falls something short of enough to offset the loss of full agricultural use of the land devoted to woodland pasture. The remainder of "all other land in farms" consists of rough, stony or waste land not in forest pasture or crops.

Perhaps if the United States census schedule could include, in the future, a question asking how large a fraction of the use of woodland pasture was for pasture, the estimate being based on its potential carrying-power if cleared of timber and in pasture, an estimate worth while could be obtained. This is the plan which is recommended in the world census for land which is double or treble cropped.

In Tables IX and X, the available data on land utilization in the United States and Switzerland are presented first in absolute terms, and then in percentage terms.

In order to understand the extent to which the figures for the United States and Switzerland are comparable, a few other explanations are needed.

The figure for arable land for Switzerland is suspiciously low because of the fact that a large portion of the crop land of Switzerland is in permanent meadow, which is pastured part of the season and cut for hay during the rest of the season.\* In the United States, most of the meadow classified as arable according to the definition given above is in rotation with crops and therefore is counted as arable land. These differences in cultural practices make the resulting figures of doubtful comparability.

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\* "Permanent meadow" in Switzerland does not mean that there is no rotation between crop land and meadow. The rotation is, however, not frequent, and in certain regions has been abandoned.



Table IX. - COMPARISON OF LAND UTILIZATION IN THE UNITED STATES AND SWITZERLAND

Pro- duction: year	(1)		(2)	
	Total area		Land in farms	
	United States	Switzer- land	United States	Switzer- land
1926	:	:	:	:
1924	:1,903,216,640	:10,204,221	:924,319,352	:
1923	:	:	:	:
1922	:	:	:	:
1919	:1,903,215,360	:	:955,883,715	:
1917	:	:	:	:
1912	:	:10,205,066	:	:
1909	:1,903,289,600	:	:878,798,325	:
1905	:	:	:	:5,128,262
1901	:	:10,247,161	:	:
1899	:1,903,461,760	:	:838,591,774	:
1877	:	:10,227,665	:	:

Pro- duction: year	(3)		(4)	
	Land in crops		Pasture land	
	United States	Switzer- land	United States	Switzer- land
1926	:	:	:	:
1924	:347,600,000	:	:	:
1923	:	:	:	:
1922	:	:	:	:
1919	:358,000,000	:	:818,000,000	:
1917	:	:	:	:
1912	:	:	:	:
1909	:321,500,000	:	:	:
1905	:	:2,841,314	:	:
1901	:	:	:	:
1899	:293,000,000	:	:	:
1877	:	:	:	:

(1) United States - Bureau of Census Reports.

Switzerland - The figures for 1877 and 1901 are taken from the Statistical Yearbooks for 1891 and 1901. The 1912 and 1924 figures are taken from 'Arealstatistik' 1912 and 1923/24 respectively, published by the Federal Office of Statistics.

Footnote continued

Table IX. - COMPARISON OF LAND UTILIZATION IN THE UNITED STATES AND SWITZERLAND (Continued)

Pro- duction: year	Pasture land in farms (5)		Timber land (6)		Woodland in farms (7)	
	United States	Switzer- land	United States	Switzer- land	United States	Switzer- land
1926	:	:	:	:	:	:
1924	:407,935,553:	:	:	:	:143,794,192:	:
1923	:	:	:	:2,225,499:	:	:
1922	:	:	:	:	:	:
1919	:311,000,000:	:	:483,000,000:	:	:167,730,794:	:
1917	:	:	:	:	:	:
1912	:	:	:	:2,178,691:	:	:
1909	:	:	:	:	:190,865,553:	:
1905	:	:1,698,952:	:	:2,060,275:	:	:496,508
1901	:	:	:	:	:	:
1899	:	:	:	:	:	:
1877	:	:	:	:	:	:

- (2) United States - Bureau of Census Reports. See text for changes in definitions.  
Switzerland - Farm Census of 1905.
- (3) United States - Recent unpublished estimates of the acreage of land in crops harvested, by Dr. O. E. Baker, United States Department of Agriculture.  
Switzerland - Includes meadows, arable land, vineyards and gardens (see p. 130). No questions were asked regarding multiple and companion crops or of fallow, idle and crop failure land in the Census of 1905 although the above figures may include some acreage of this kind. In the 1929 Census, provision is made for multiple and companion crops, but nothing is provided for an enumeration of crop failure. Fallow land, too, is not classified. (Land is too expensive to be left fallow or idle).
- (4) United States - Estimate of Dr. O. E. Baker, U.S.D.A. Yearbook, 1923, for all pasture land in the United States.
- (5) United States - United States Census report for 1924, and the same as (4) for 1919.  
Switzerland - Farm Census of 1905.
- (6) United States - Same as (4).  
Switzerland - 1905 Census on enterprises. 1912, Arealstatistik. 1924, Arealstatistik. For "definitions," see pp. 118 & 122, (there does not seem to be a clear definition).
- (7) United States - Bureau of Census reports.  
Switzerland - Farm Census of 1905.



Table IX. - COMPARISON OF LAND UTILIZATION IN THE UNITED STATES AND SWITZERLAND (Continued)

Pro- duction: year	Improved land in farms (8)		(9)		(10)	
	United States	Switzer- land	United States	Switzer- land	United States	Switzer- land
1926	:	:	:	:	:	:
1924	:	:	:332,395,000:	:	:799,395,460:	:5,677,540
1923	:	:	:	:	:	:
1922	:	:	:	:	:	:
1919	:452,810,708:	:	:340,850,000:	:	:817,782,255:	:
1917	:	:	:	:501,188	:	:
1912	:	:	:	:	:	:5,735,769
1909	:400,346,575:	:	:304,313,000:	:	:745,770,393:	:
1905	:	:	:	:700,192	:	:4,640,130
1901	:	:	:	:	:	:5,442,186
1899	:434,093,287:	:	:277,543,000:	:	:	:
1877	:	:	:	:	:	:5,417,335

(8) United States - Bureau of Census reports.

(9) United States - Acreage of land in crops as estimated by Dr. O. E. Baker, minus acreage of wild grasses cut for hay as given in the U.S.D.A. Yearbook, 1928, p.857, for 1909, 1919, and 1924; and as reported by the United States Census, for 1899.

Switzerland - For 1905, arable land includes the acreage of land in cultivated crops, artificial grass land and gardens on farms, as reported in the Farm Census of 1905, plus land in vineyards, as reported by the Swiss Statistical Office for 1905. For 1917 and 1926, arable land includes the same categories minus artificial grass land.

(10) United States - In 1924, agricultural land included land in crops and pasture. In 1909 and 1919 it included improved land in farms, as reported by the United States Census, plus an estimate of "woodland pasture" and "other pasture land" comparable with the 1924 classification. The acreage of "woodland pasture" in 1909 and 1919 was estimated by multiplying the acreage of woodland in each year by the percentage that woodland pasture was of total woodland in 1924. Similarly, the acreage of "other pasture land" in 1909 and 1919 was estimated by multiplying the acreage of "other unimproved land in farms" each year by the percentage that "other pasture land" was of the total acreage in "other pasture land" and "other land in farms" in 1924.

Switzerland - In 1905, agricultural land includes land in crops, pasture land, and marsh land in farms, as reported in the Farm Census. For

Footnote continued

Table X. - COMPARISON OF LAND UTILIZATION IN SWITZERLAND AND THE UNITED STATES IN TERMS OF PERCENTAGES \*

	United States			Switzer-
	1900	1910	1920	land 1905
Percent of total land area represented by -	:	:	:	:
Land in farms	: 44.1	: 46.2	: 50.2	: 50.0
Improved land in farms	: 21.8	: 25.1	: 26.4	: -
Unimproved land in farms	: 22.8	: 21.1	: 23.8	: -
Woodland in farms	: -	: 10.0	: 8.8	: 4.8
Other unimproved land in farms	: -	: 11.1	: 15.0	: -
Land in crops	: 15.4	: 16.9	: 18.8	: 27.7
Timber land	: -	: -	: 25.4	: 20.1
Pastured land	: -	: -	: 43.0	: -
Pastured land in farms	: -	: -	: 15.3	: 16.6
Agricultural land	: -	: 39.2	: 43.0	: 45.3
Arable land	: 14.6	: 16.0	: 17.9	: 6.8
Percent of all land in farms represented by-	:	:	:	:
Improved land in farms	: 49.4	: 54.4	: 52.6	: -
Unimproved land in farms	: 50.6	: 45.6	: 47.4	: -
Woodland in farms	: -	: 21.7	: 17.5	: 9.7
Other unimproved land in farms	: -	: 23.9	: 29.9	: -
Land in crops	: 34.9	: 36.6	: 37.5	: 55.4
Arable land	: 33.1	: 34.6	: 35.7	: 13.7
Agricultural land	: -	: 84.9	: 85.6	: 90.5
Pastured land in farms	: -	: -	: 32.5	: 33.1
Percent of improved land in farms represented:	:	:	:	:
by -	:	:	:	:
Land in crops	: 68.3	: 65.1	: 69.3	: -
Improved farm land pastured	: -	: -	: 13.9	: -

1912 and 1924, it represents the productive land area of Switzerland, as determined in a special survey by the Swiss Statistical Office. Gardens in cities were included as productive land, but it is not entirely clear whether or not marsh land is considered as productive in these special surveys. The figures for 1877 and 1901 are those published in the Statistical Yearbooks for 1891 and 1901.

\* See Table IX for original data and definitions.



No figure for woodland not in pasture is available for the United States censuses of 1909 and 1919, and it is, therefore, not possible to obtain a census figure for agricultural land. If one assumes that woodland not used for pasture represents the same percentage of woodland in farms, in these years as in 1924, the figures presented in Table IX will be obtained for agricultural land. The following calculation indicates how they were obtained:

	1909	1919
Total land in farms	878,798,325	955,883,715
Deductions:		
Woodland not used for pasture	89,057,866	78,263,187
Other land in farms according to 1924 classification	43,970,066	<u>59,838,273</u>
Agricultural land	745,770,393	817,782,255

In 1924, 47 percent of the woodland in farms was not used for pasture. An estimate also needs to be made for the item "other land in farms" which, as above explained, is not included as agricultural land. In the 1909 and 1919 censuses, the nearest comparable classification is "other unimproved land in farms." This probably is the rough equivalent of "other land in farms" plus "other pasture land" of the 1924 census, of which, in 1924, 21 percent was "other land in farms." This 21 percent, applied to the figures for "other unimproved land", gives the figures used in the above classification for "other land in farms" in 1909 and 1919. That such a method of estimating is fairly reasonable is indicated by the fact that there were 285 million acres of "other unimproved land in farms" in 1919, and 275 million acres of land in farms classified as "other pasture land" plus "all open land in farms" in 1924. The figure for "other unimproved land in farms" for 1909 is 209 million acres.

For Switzerland, agricultural land in 1905 includes "land in crops" plus "pastured land" plus "marshland on farms," as reported in the Farm Census. For 1912 and 1924, it represents the productive land area for Switzerland as determined by a special survey of the total land area by the Statistical Office. Gardens in cities were included as productive land. The totals for 1905 are, therefore, not comparable with those for 1912 and 1924. Furthermore it is not entirely clear whether the special survey included marshland as productive.

The classification "land in crops" includes, for the United States, the land in all the important crops other than forest and pasture land. For Switzerland, it includes, as above explained, in addition to the land in cultivated crops, that in artificial and permanent meadow, even though pastured part of the year. Gardens on farms as reported in the Farm Census of 1905, and land in vineyards as reported in the Annual Census of Vineyards of that year are also included.

I. Ratios of Population to Land and of Agricultural Workers to Land

The following tables combine the data of earlier sections in such a way as to test out the relation of the population to the land resources and intensity of agricultural production in the two countries. The data are so incomplete that very few comparisons are possible for identical years. Trends can be observed in some items. The actual data are subject to all the limitations described above, and the comparisons to all the differences in definition above indicated. The reader must not be misled by the decimals into assigning specious accuracy to the results.



Table XI. - ACRES OF LAND IN MAJOR CLASSIFICATIONS PER CAPITA OF TOTAL, RURAL AND FARM POPULATION AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES (1909) AND IN SWITZERLAND (1905)\*

Land classification	Per Capita of :			
	Total population		Rural population	
	United States 1909	Switzer- land 1905	United States 1909	Switzer- land 1905
Classification of land in farms	:	:	:	:
Total land in farms	9.56	1.46	21.11	5.49
Land in crops	3.50	.80	7.72	3.04
Woodland	2.08	.14	4.58	.53
Pasture land*	2.94	.48	7.33	1.82
Arable land	3.31	.20	7.31	.75
Agricultural land	8.11	1.32	17.91	4.96
Classification of land not in farms	:	:	:	:
Timber land	2.89	.45	7.43	1.67
Pasture land	4.80	:	11.95	:

\* See Tables III and IX for original data and definitions.

Table. XI. - ACRES OF LAND IN MAJOR CLASSIFICATIONS PER CAPITA OF TOTAL, RURAL AND FARM POPULATION AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES (1909) AND IN SWITZERLAND (1905)\* (Continued)

Land classification	: Per Capita of		: Per person 15 years	
	: Farm population		: and over gainfully	
	: United	: Switzer-	: employed in agriculture	
	: States	: land	: U. S.	: Switzerland
	: 1909	: 1905	: 1909	: 1905
Classification of	:	:	:	:
land in farms	:	:	:	:
Total land in	:	:	:	:
farms	: 27.99	: 4.55	: 90.60	: 11.04
Land in crops	: 10.24	: 2.74	: 33.14	: 6.12
Woodland	: 6.08	: .48	: 19.68	: 1.07
Pasture land*	: 10.04	: 1.64	: 30.59	: 3.66
Arable land	: 9.69	: .68	: 31.36	: 1.51
Agricultural land	: 23.75	: 4.48	: 76.87	: 9.99
Classification of	:	:	:	:
land not in farms	: <u>1919</u>	: <u>1905</u>	: <u>1919</u>	: <u>1905</u>
Timber land	: 10.17	: 1.51	: 31.00	: 3.37
Pasture land	: 16.35	:	: 49.86	:

\* See Tables III and IX for original data and definitions.



Table. XII. - ACRES OF LAND IN FARMS PER CAPITA OF TOTAL, RURAL,  
AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE  
IN THE UNITED STATES, 1879-1924, AND SWITZERLAND, 1905\*

Pro- duction year census	Total population		Rural population	
	United States	Switzer- land	United States	Switzer- land
	1924	8.07		
1919	9.04		22.53	
1909	9.56		21.11	
1905		1.46		5.49
1899	11.07		21.40	
1889	9.90		17.36	
1879	10.69			

Pro- duction year census	Farm population		Gainfully employed in agriculture (15 years and over)	
	United States	Switzer- land	United States	Switzer- land
	1924	31.89		
1919	30.84		94.03	
1909	27.99		90.60	
1905		4.95		11.05
1899				
1889				
1879				

\* See Tables III and IX for original data and definitions.

Table XIII. - ACRES OF LAND IN CROPS PER CAPITA OF TOTAL, RURAL,  
AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE  
IN THE UNITED STATES 1879-1924, AND SWITZERLAND, 1905 \*

Pro- duction year census	Total population		Rural population	
	United States	Switzer- land	United States	Switzer- land
1924	3.03			
1919	3.39		8.44	
1909	3.45		7.72	
1905		.80		3.04
1899	3.86		7.45	
1889	3.69		6.48	
1879	3.54			

Pro- duction year census	Farm population		Gainfully employed in agriculture (15 years and over)	
	United States	Switzer- land	United States	Switzer- land
1924	11.99			
1919	11.55		35.21	
1909	10.24		33.14	
1905		2.74		6.12
1899				
1889				
1879				

\* See Tables III and IX for original data and definitions.



Table XIV. - ACRES OF ALL TIMBERLAND PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES, 1919, AND SWITZERLAND, 1905-1923\*

Pro- duction year census	Total population		Rural population	
	United States	Switzer- land	United States	Switzer- land
	1923		.57	
1919	4.57		11.38	
1912		.57		2.38
1905		.59		2.20

Pro- duction year census	Farm population		Gainfully employed in agriculture (15 years and over)	
	United States	Switzer- land	United States	Switzer- land
	1923			
1919	15.28		47.50	
1912		2.17		4.70
1905		1.99		4.44

\* See Tables III and IX for original data and definitions.

Table XV. - ACRES OF TIMBER LAND ON FARMS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES, 1909-1924, AND SWITZERLAND 1905 \*

Pro- duction year census	Total population		Rural population	
	United States	Switzer- land	United States	Switzer- land
1924	1.26			
1919	1.59		3.95	
1909	2.08		4.58	
1905		.14		.53

Pro- duction year census	Farm population		Gainfully employed	
	United States	Switzer- land	United States	Switzer- land
1924	4.96			
1919	5.41		16.50	
1909	6.08		19.68	
1905		.48		1.07

\* See Tables III and IX for original data and definitions.



Table XVI. - ACRES OF ARABLE LAND PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES, 1879-1924, AND SWITZERLAND, 1905-1926 \*

Pro- duction year census	Total population		Rural population	
	United States	Switzer- land	United States	Switzer- land
1926		.12		
1924	2.90			
1919	3.22		8.03	
1917		.13		.55
1909	3.31		7.31	
1905		.20		.75
1899	3.65		7.06	
1889	3.45		6.05	
1879	3.23			

Pro- duction year census	Farm population		Gainfully employed in agriculture (15 years and over)	
	United States	Switzer- land	United States	Switzer- land
1926				
1924	11.47			
1919	11.00		33.52	
1917		.50		1.08
1909	9.69		31.36	
1905		.68		1.51
1899				
1889				
1879				

\* See Tables III and IX for original data and definitions.

Table XVII. - ACRES OF AGRICULTURAL LAND PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES, 1924, AND SWITZERLAND, 1877-1924 \*

Pro- duction year census	Total population		Rural population	
	United States	Switzer- land	United States	Switzer- land
1924	6.98	1.45		
1922		1.46		
1912		1.50		6.26
1905		1.32		4.96
1901		1.63		5.75
1877		1.95		

Pro- duction year census	Farm population		Gainfully employed in agriculture (15 years and over)	
	United States	Switzer- land	United States	Switzer- land
1924	27.58			
1922				
1912		5.72		12.36
1905		4.43		9.99
1901		5.15		11.71
1877				

\* See Tables III and IX for original data and definitions.



J. Crops and their Acreage

Sources listed in Part I are Statistische Mitteilungen, Statistische Quellenwerke der Schweiz, and Statistisches Jahrbuch der Schweiz, under the Eidgenössisches Departement des Innern; Statistiques et Évaluations Agricoles, Recherches relatives à la Rentabilité de l'Agriculture and Publications 1-99, under Union Suisse des Paysans; Rapports Économiques de la Feuille Officielle Suisse du Commerce and Wirtschaftliche und Sozialstatistische Mitteilungen, under the Volkswirtschaftsdepartement; Anbaustatistik der Schweiz, under the Statistisches Bureau; and Landwirtschaftliches Jahrbuch der Schweiz.

The interesting other sources of information, mostly cantonal, are as follows:

Mitteilungen des Statistischen Bureau des Kanton Bern.  
Landwirtschaftliche Statistik.

Statistische Mitteilungen betreffend den Kanton Zürich,  
1883-1893, 1905-1907, 1909-10.\*

Statistique Agricole du Canton de Vaud 1895-97.

Milliet, E. W.- Notiz über die Methoden der Kantonalen Weinbaustatistik.  
Zeitschrift für Schweiz. Statistik, 1908/1, p.276.

Howald, Oskar - Statistische Erhebungen und Schätzungen über den Schweiz.  
Obstbau. Zeitschrift für Schweiz. Statistik, 1924, p.70.

Three censuses have collected information concerning the acreage planted with different kinds of crops. Unfortunately they are all very incomplete and not even comparable. This is explained by the fact that the two censuses of 1917 and 1919 were war-time measures for collecting data on production, while the census of 1926 was somewhat of an experiment, with the world census of agriculture of 1929 in view. It was taken in connection with the census of livestock. All three censuses were restricted to the enumeration of the arable land, leaving out all grass and pasture land, and also the arable land used for any kind of alfalfa or clover, for garden land and for vineyards, and also marsh land. These important differences can be very roughly seen from the following data:

	Number of producers	Area
1917	432,282	191,668.31 ha.
1919	476,272	209,242.07 "
1926	278,874	184,662.48 "

\* From 1894-1904 the results are published only in the Statistical Yearbook of Switzerland.

The following facts explain more in detail the noncomparability of these three censuses. The 1917 census included all land in gardens as well as in farms. Only the land in gardens of less than 50 square meters in size was excluded. The planters were responsible for the enumeration of their land, whether they owned it or cultivated it on a lease. The schedules were checked by the communal authorities. An attempt was made to separate the land in regular farms from that cultivated by factory workers and others not farmers. The Bureau of Statistics admits, however, that on account of the lack of a clear definition of a farm, the returns in regard to this item are very doubtful. For that reason, this distinction was abandoned in the census of 1919. The setting up of a minimum size of area which had to be reported was also abandoned. Owing to these changes and to the extraordinary circumstances prevailing at that time, the number of planters was very high. Towns and villages provided cheap land for factory workers and other agricultural workers for growing all kinds of vegetables. The statistics showed that 57 out of every 100 households were cultivating land at that time. The census of 1926, in contrast with the foregoing, was restricted to owners and possessors of livestock, also with land in crops. To these were added only the bee and poultry farms.

The schedules of the different censuses varied very much, being more simplified with each succeeding census. Unimportant crops were gradually omitted, as for example, millets and hops, several minor kinds of cereals and some vegetables. A full list of crops included in the census of 1917 is given on page IV of the report. They have been classified under five major headings, as follows:

1. Cereals - wheat, spelt, rye, barley, oats, etc.
2. Legumes - peas and beans.
3. Root crops - potatoes, beets, sugar beets, etc.
4. Vegetables - cauliflower, cabbage, etc.
5. Crops for industrial purposes - flax, tobacco, etc.

Special care was taken to ascertain which of these crops were planted intermittently. A distinction was therefore made between "principal crops" and "intermittent crops." The intermittent crops whose area was recorded were beets, carrots and vegetables (cabbage, etc.). The intermittent crops are grown along with the principal crops on the same land in the same year. In 1919, carrots were included in the vegetables, and several other crops also were found not worth asking for separately, but were grouped under one head, as for example, the different kinds of beans, also flax and hemp, and two different kinds of beets.



These changes, together with the abandonment of the minimum size of gardens which came under the census, makes it extremely difficult to compare the figures of the two censuses. Nevertheless, the figures of the two censuses of 1917 and 1919 have been put together in a table in the 1919 publication, which takes into consideration the major changes and gives the comparable figures as accurately as possible.

The schedule of 1926 was again altered. Two kinds of cereal and chicory were simply stricken out. Poppy (Mohn) was put in as a separate item. The carrots were taken away from the vegetables and asked for as an intermittent crop. It should be noted that the area planted with intermittent crops is not counted in making up the total acreage, since it is already included in the acreage for the principal crops.

The classification of cereals into "cereals used for making bread" and "others" is somewhat misleading, inasmuch as corn, barley and oats are sometimes also used for making bread, especially in the mountainous parts of Switzerland. These figures too must be used cautiously. In Statistische Erhebungen etc. on page 15, for example, the acreage planted with cereals is given, for 1917, as 117,182 hectares. The census gives the figure of 117,337 hectares. The difference, 156 hectares, comes from the omission of buckwheat, which, in 1919, was put with others under one item and cannot be separated. It is therefore included in the figure of "cereals for bread", and in the total figures of "cereals."

The censuses of 1917 and 1919 were taken in the second week of July, the census of 1926 in the first week of June. By this time all the different crops are planted, or at least the land is planned for them.

Two other war-time enumerations should be mentioned at this place, the census of the area planted with potatoes in 1917 and 1918, and the census of the wheat acreage in 1918. They are interesting only as giving an idea about how quickly and to what extent the land in some parts of Switzerland can be transformed from permanent grass land to arable land.

The accuracy of all these censuses is very much doubted by the Statistical Office of the Canton of Bern, which since 1885 has collected annual data concerning agricultural production in the canton. Every five years this office also obtains the acreage planted to different kinds of crops. Although its methods differ greatly from those used

in the federal censuses, the cantonal office has tried to check its results with those of the federal census of 1926. The differences were considerable in some cases, as appears in the following figures:

	<u>Federal census</u>	<u>Cantonal returns</u>
Wheat	9272.33 ha.	9490.04 ha.
Spelt	7041.14 ha.	7746.68 ha.
Rye	6562.59 ha.	7002.15 ha.

The methods used by the cantonal office will be described in detail below. This office is of the opinion that the farmers stated their acreage too small in the federal census. Another reason for the different results may be that the federal census was taken on a "farm basis," neglecting the political boundaries, while the cantonal inquiries are based on returns of the political units. Some farms may be situated in two cantons.

No other federal censuses on acreage in crops have ever been taken. In the Handwörterbuch and the Volkswirtschaftslexikon are several figures for the total area cultivated at different times in different crops, but these are based merely on estimates and cannot be checked as to their reliability.

Only the figures relating to wine culture can claim to have a degree of accuracy. They are collected by the governments of the cantons in the form of inquiries of the communal authorities. From 1891 onwards, when the results from the first few cantons were published in the first edition of the Yearbook, the table was steadily enlarged. In 1908, only three cantons did not report to the office. This number increased to 7 in 1928. Wine culture in these cantons, however, is of no importance. Figures of a few cantons can be traced back very far, for the Canton Bern as far back as 1831. These cantonal figures can be checked against those of the survey of the area in 1877, already mentioned, to see how large the differences in the returns have been. The census figure of 1905 is 3300 hectares less than the figure returned in the cantonal statistics. This discrepancy has been mentioned above.

Before the census of 1929, no land was ever classified separately as orchards in Switzerland. The land where the fruit trees are planted is always used for hay or grass production, sometimes even for wheat production. Several cantons, however, have made censuses of the fruit trees. (See below, Section N).



Only for a few cantons are statistics available of the land in different crops, over a longer period. These are Bern, Zürich, Waadt and Aargau. The Statistical Office of the Canton of Bern in 1885 inaugurated a yearly census of the total agricultural output. In addition, every five years the acreage in different crops has been ascertained. The method used for these censuses differs entirely from that used by the federal censuses. The unit is the political commune. By order of the Cantonal Government, the communal authorities act as enumerators, and have to fill out the blanks provided by the Statistical Office as accurately as possible. For their information, they have to rely on the cadasters and the tax registers. If these are incomplete or otherwise unreliable, estimates have to be made. If a commune wishes, it can also adopt the method of personal inquiries with every producer. The schedules for this purpose are also provided by the Statistical Office. This latter method has been used very seldom, however. These censuses include all the land, whether in farms or not, except that used exclusively for pasture. The schedule is printed in Mitteilungen des Bernischen Statistischen Bureaus, 1912, Lief. I, p. 11.

On the schedules forwarded to the communes, the returns of the last census are quoted for comparison and as a starting point for the reporters. The schedule is divided into three parts, the first dealing with the acreage in three principal classes, vineyards, arable land and meadows, the second with the distribution of arable land into cereals, root crops, artificial fodder crops and vegetables, legumes, etc., and the third with a still more detailed classification of the four classes listed in the second part, and also of crops used for industrial purposes, and of meadow crops or hay. In answering the questions of the second part, the reporters are allowed, in case the acreage cannot be measured exactly in hectares, to give only the percentage distribution of the arable land. For hay the reporters have to classify the total acreage of meadows into good, medium and bad land. Also in an additional question, the acreage of marsh and turf land is asked for. Until 1921 the reporters were allowed, if they preferred, to give the percentage division in place of the exact numbers of hectares for the detailed subdivision of cereals, root crops, fodder crops and hay. Since 1921 the acreage has been required.

The results obtained by this method of collection are considered more reliable than the results obtained by individual farm schedules; the individual farmers are believed to be inclined to understate their area. But these communal reports are sometimes inaccurate also, as is pointed out by the Statistical Bureau in the report on the census of 1921, (Jahrgang 1923, Lief. I, p. 14), owing to the lack of reliable

land surveys and to errors in estimates as well as simply to carelessness of reporters. Nevertheless, these cantonal censuses for Bern are the best available information on the land in individual crops, for the limited area in Switzerland which they cover.

The Canton Zürich made attempts to ascertain the land in crops in 1874, 1884, 1891 and 1910. The method used by the Statistical Office of the Canton Zürich is the same, except for details, as that used in Bern. The census was taken in June, June 30 being set as the latest date for returning the blanks to the office. The reporters were allowed either to canvass the farmers for the exact data or they could simply make estimates. The estimates were made as percentage divisions of the total area in the same class of land. The main classification was into eight groups as follows: Home gardens, vegetables in the field and truck farming, nurseries, vineyards, arable land (including cereals, root crops, other fodder crops, clover, lucerne, etc.), meadows (including orchards), marsh and turf land and woodland (according to classification by the forest service).

In the 1910 census, the meadows had to be classified as "good", "medium" and "bad." To secure a uniform classification, the Statistical Office issued the following instructions:

"A meadow must be classified as 'good,' if the crop in the two cuts in a normal year is large and if the meadow can be pastured in the fall in addition. It is <sup>also</sup> a 'good' meadow' if, after being pastured in spring time, the yield of hay in the two cuts is still large."

"Meadows are called 'medium,' if the yield of hay in the two cuts is of medium size."

"Meadows are classified as 'bad,' if they can be cut for hay only once a year."

The Statistical Office is of the opinion that, although no definitions were announced for the earlier censuses, the practices of the reports conformed closely to those used in 1910, so that the results of the different years may be compared very well.

The table on the distribution of the area in Switzerland, as published by the International Yearbook of Agricultural Statistics 1927/28, is based on the survey of the total area of 1923/24, and the census of crop acreage of 1926. It is therefore very easy to distinguish the largely estimated items from real census figures. The estimated items are:



- I-2. Sown grasses and other fodder crops.
- II. Permanent meadow and pasture.
- V. Marsh and heath land.

The figures for cereals and other crops and bare fallow are taken from the 1926 census, those for forest area and those for the area of unproductive land from the 1923-24 survey. The area given for wine culture is as reported by the Federal Statistical Office, except as slightly adjusted for the omissions in the data collected.

Where the figures given for 1927 do not coincide with the figures of 1926, they represent estimates only made by the Farmers' Secretariat in Brougg. Up to 1926 the estimates of the area in cereals were based on information received from the crop reporters, who had to state the changes in percentage figure. This method was found to be unreliable and was, therefore, abandoned.

Switzerland has already carried out its part in the proposed world census of agriculture. By decree of the Federal Council of June 18, 1928, a general census of enterprises like that in 1905 was ordered. The date was set as August 22, 1929. As for agriculture, the method of taking the census is essentially the same as followed in 1905. The individual farm remains the basic unit, but much more care is taken to separate the "real farms" from the enterprises. (See Section D). The area included in this census will be somewhat larger, for the minimum size required to set up a "farm" was lowered from 1/2 hectare to 1/4 hectare (25 ares). Moreover, all special types of farms, as for example, fruit farms, truck farms, nurseries, bee farms, etc., have been included, even if they are of a size less than 25 ares of land. As regards land utilization, the schedule is very much enlarged, compared with that for the census of 1905. The main classification and the definitions used in classifying the land are as follows:

1. Arable land and gardens, including sown grasses used as fodder crops.

According to the instructions printed on the schedule, this item includes all land which is regularly plowed. (For sown grasses, the interval may be of several years). If the land is used for more than one crop in any one year, the area has to be divided between these crops according to the best estimate possible. Clover sown in ripening wheat, however, must be omitted and the acreage is counted as wheat land. Clover sown in oats or corn which are harvested as fodder is reported separately, but the area is classified under the item "sown grasses."

Item 1 includes the following subclasses of cultivated land:

- a. Cereals (9 classes).
- b. Root crops, beets other than sugar beets (4 classes.)
- c. Sown grasses (3 classes).
- d. Plants for industrial purposes (5 classes including sugar beets).
- e. Truck crops (legumes, cabbage, etc., 5 classes).
- f. Gardens, small fruit, fruit tree nurseries and orchards (5 classes).

The schedule for cereals is very much like that used in the census of 1917. Class b (root crops) is changed only to the extent that sugar beets, until now classified always as root crops, have been transferred to the class of "plants for industrial purposes." Entirely new are the classes c (sown grasses) and f (gardens, small fruit, etc.) In an additional question, the farmer is asked to state the number of hectares which were used for the cultivation of intermittent crops, and the acreage of sown grasses which was used for seed.

## 2. Permanent meadows.

Besides permanent grass land, this class includes also the "sown grass land" which in all probability is not going to be plowed again.

## 3. Vineyards.

## 4. Pasture land.

Pasture land includes only the area used exclusively for pasturing. It excludes, therefore, all that land on the mountains on which the grass is cut for hay. This census attempts also to obtain results on the productivity of pasture land, by means of additional question which is based on the old custom of measuring productivity of the mountain pasture land by the number of cows which can be pastured on it for a period of 90 days ("Kuhrechte"). Other classes of livestock are reduced to the cow-unit, according to a uniform scale. (See Section I). This had already been done in the census of alps, conducted by the Alpwirtschaftlicher Verein (see above). A comparison of the results will be possible.



5. Forest land.

According to the instructions, the forest land includes only the "real forests." Bushes are expressly excluded.

6. Marsh and turf land.

7. Fish ponds.

8. Unproductive area (creeks, roads, farm yards, etc.)

The census also attempts to ascertain the area in green houses and under cold frame (in square meters).

No special questionnaire was prepared for the forest enterprises in this census. Whether comparisons can be made with the census of 1905 will depend on the method adopted for working up the results of the census. The instructions given as to the method of reporting the total forest area of the cantons, the communes, and the private holdings are of no special importance.

The proposed world census of agriculture would classify the acreage of crops harvested according to 15 main classifications, as given below. These are listed here so as to indicate the nature of the task involved.

- (1) Cereals cut for grain (11 sub-divisions as follows:  
winter wheat; spring wheat; oats; barley; rye;  
millet; maize; rice; sorghum; maslin; other cereals  
cut for grain).
- (2) Leguminous plants for grain (5 sub-divisions as  
follows: beans; soy beans; peas; lentils; other le-  
guminous plants for grain).
- (3) Tuber or root crops for food or fodder (6 sub-divi-  
sions as follows: potatoes; sweet potatoes and yams;  
tuber and root crops for forage (turnips, mangolds,  
swedes, carrots, etc.); arrow-root; manioc; other  
tubers and roots).
- (4) Cultivated grasses and leguminous plants for hay and  
forage (3 main subdivisions as follows):

1. Cultivated tame grasses and clovers sown within the last 5 years and intended to be plowed up in rotation.
  2. Lucerne (alfalfa).
  3. Other cultivated forage crop plants not reported elsewhere.
- (5) Crops for industrial purposes (4 main subdivisions as follows):
1. Sugar crops - 3 kinds.
  2. Fiber crops - 9 kinds.
  3. Oil seed crops - 9 kinds.
  4. Other industrial crops - 5 kinds.
- (6) Vegetables (9 subdivisions).
- (7) Crops grown for seed (4 subdivisions).
- (8) Sown land from which no crop was harvested because of crop failure or destruction.
- (9) Fallow land.
- (10) Permanent meadow and pasture.
- (11) Vineyards (3 types).
- (12) Oliveyards.
- (13) Orchard fruits and nuts (18 kinds).
- (14) Small fruits cultivated.
- (15) Miscellaneous plantations (11 kinds as follows):
1. Coffee
  2. Tea.
  3. Cocoa



4. Black pepper
5. Cinchona
6. Rubber, gum and resin plants
7. Mulberry
8. Bamboo
9. Cane
10. Sago palms
11. Other cultivated trees, shrubs, and vines not included in the preceding headings.

The world census committee recommends the following procedure in enumerating the areas where double-cropping, intercropping, etc., are practiced:

"When two or more different crops are planted together but harvested separately (companion crops), show the area occupied by each crop separately in the proper section, wherever it is possible to determine, at any rate approximately, the area under each particular crop. In the cases where companion crops are so intermixed that it is not possible to make a distinction between the areas properly belonging to each of them, for each of the crops in question special columns should be inserted in the forms, after the columns indicated in the standard form. In these special columns the total area occupied by the companion crops should be shown against the most important crop, and should be repeated in brackets against the name of the other associated crops.

"When a second crop is planted and harvested on the same land as that from which a first crop has already been harvested during the same year, in order to avoid duplication and the indication of a larger area under crops than there is crop land on the farm, the area of the previous first crop should be entered on the open line and that of the succeeding or multiple crop in the following space in square brackets.

"When crops supply several products, as is the case with flax and hemp (seed and fibre), the area should be shown against the name of the chief product, and repeated in square brackets against the name of the secondary product."

The major classifications in the 1930 United States Census were:

1. Corn (5 subclasses).
2. Sorghums (3 subclasses).
3. Sugar crops (3 subclasses).
4. Small grains (12 subclasses).
5. Annual legumes (6 subclasses).
6. Hay crops and sweet clover pasture (8 subclasses).
7. Grass seeds harvested (3 subclasses)
8. Miscellaneous crops (5 subclasses).
9. Vegetables harvested for sale (14 subclasses).
10. Orchard fruits, nuts, and grapes (total acreage).

In the 1929 census in Switzerland, as indicated above, a somewhat different classification was used:

1. Cereals (9 subclasses).
2. Root crops, beets other than sugar beets (4 subclasses).
3. Sown grasses (3 subclasses).
4. Plants for industrial purposes (5 subclasses including sugar beets) .
5. Truck crops (legumes, cabbage, etc., 5 subclasses).
6. Gardens, small fruits, fruit tree nurseries and orchards (5 subclasses).

In the 1930 United States census, if two crops were grown on the same land, but not at the same time, the practice was followed of reporting the full number of acres of each crop raised. This acreage, however, was included only once under the total acreage of land in crops. In the case of interplanted or mixed crops, the acreage was divided equally among the several individual crops.



K. Livestock

Classification, Numbers, Amounts

Part I lists, as sources, Schweizerische Statistik, the numbers on livestock being 9, 13, 31, 37, 70, 116, 132, 152, 178, 207, 213, that on poultry, 215, and those on beehives, 31, 70, 116, 132, 179, 214; Résultats du Recensement du Bétail 1886 dans le Canton des Grisons, and Eidgenössische Betriebszählung, 1905, under the Statistisches Bureau; Schweizerische Statistische Mitteilungen, and Statistisches Jahrbuch der Schweiz, under the Eidgenössisches Departement des Innern; Beiträge zur Statistik der Schweiz, under Departement des Innern; Publications 1-99 and Statistiques et Évaluations Agricoles, under the Union Suisse des Paysans; Rapports Économiques de la Feuille Officielle Suisse du Commerce, under the Volkswirtschaftsdepartement; and Annuaire Agricole de la Suisse.

Other sources of information are as follows:

Zeitschrift für Schweiz. Statistik, 1866, 1876, 1886, 1896, containing the results of the censuses on livestock of 1866, 1876, 1886, 1896, and the censuses on beehives of 1876, 1886 and 1896.

Handwörterbuch der Schweiz. Volkswirtschaft, Artikel: Viehzählungen.

Statistisches Handbuch für den Kanton Bern. Mitteilungen des Kantonalen Statistischen Bureaus, 1917, Lieferung I/II.

Forschungen auf dem Gebiete der Landwirtschaft.

Censuses on livestock and other animals have been taken for the whole of Switzerland, since 1866, at regular intervals. The interval was first 10 years, then shortened later on to 5 years. From 1931, on the census will be taken every year. The years of the censuses thus far taken are as follows: 1866, 1876, 1886, 1896, 1901, 1906, 1911, 1916, 1921, and 1926, to which three extraordinary censuses should be added in the years 1918, 1919, and 1920. The date has nearly always been April 21, or within a few days of it. It is argued that the census in April does not obtain a normal amount of livestock, especially in certain classes and in certain regions, but it seems to be the most satisfactory time for it. A census in summer is considered impossible on

account of pasturing the cattle all over the mountains.

The methods used for these censuses have varied somewhat, not only as to the classification of the animals, but also as to the procedure of enumeration. The schedule is drafted by the Federal Bureau of Statistics, and subsequently submitted to the cantonal governments and the organizations concerned with the livestock industry. In earlier years a special committee of experts was appointed to deal with the proposals and to put the schedule in final shape; in later years this task was performed by the permanent committee on statistics.

The commune has always been the basic unit. The district authorities and the cantonal governments have supervised the work. The enumeration itself is made by specially appointed enumerators, who are, for the most part, regular cattle inspectors (veterinaries). For the Censuses I to V, the enumerators collected the figures by interviewing every cattle owner. Later on, a written statement by the owner was required. The results are checked by the communal authorities. In the case of obviously false returns, an investigation on the farm can be ordered. The livestock is enumerated at the place of legal residence of its owners or possessors and not in the commune where it is located at the time of enumeration. This possibly has introduced several mistakes into the returns, especially in mountainous parts of the country. Double counting is not prevented absolutely by this method. Wandering herds tend to be counted in the commune of their location.

Unfortunately, the schedule used for these censuses has been changed very frequently, thus preventing detailed comparison of the returns, especially of the minor classifications. The classes have been more subdivided in later counts; the number of classes of beef cattle and cows, for example, has increased from 6 to 10. There has been a change from the biological basis of classification to classifications by age groups. This will be seen from a comparison of the schedules of 1866 and 1926.

1866	1926
<u>Horses, total</u>	<u>Horses, total</u>
Stallions for breeding purposes	Horses below 4 years of age
others	Horses over 4 years of age
2 years and over	Horses for breeding purposes
below 2 years	Stallions
	Mares
	Working horses



Mares, in foal and nursing  
other mares and geldings  
over 4 years old  
under 4 years old

Asses and mules

Neat cattle, total

Bulls for breeding only

Cows

Heifers (in calf)

Oxen, for working and fattening

Heifers over 6 months

Calves under 6 months

Pigs, total

Boars

Sows

Pigs for fattening

Farrowes

Sheep

Goats

Mules, total

Asses, total

Neat cattle, total

Calves

for slaughter  
for breeding

Cattle 1/2 to 1 year old

Heifers

1-2 years old  
2 years and over

Cows

Bulls

1-2 years old  
2 years and over

Oxen

1-2 years old  
2 years and over

Pigs, total

Pigs for breeding

Boars  
Sows

Pigs for fattening  
(over 6 months)

Pigs to be bred

Farrowes  
Others

Lambs, total

Goats, total

Kids for slaughter

Kids for breeding

Rams

Goats in milk

The classification according to age groups is considered unsatisfactory in several respects. Heifers usually are in calf at the age of 18 months or even earlier in the southern part of the country. Taking the census in April makes the classification of these heifers often uncertain, as the principal calving period extends from October to December. Heifers born in the same year may thus come into two different classifications. The number of goats returned in the April census is much too large, as young kids usually are born in March and April, and the elimination of the kids for slaughter has not yet taken place entirely. The statistical office also draws attention to the fact that the number of bulls and rams is relatively high, due to the export of these animals to foreign countries for breeding purposes. The Federal Bureau of Statistics has tried to make all the censuses on livestock comparable by adjusting for the differences in classifications in tables to be found at the end of each volume of census results.

Also for purposes of comparison of the census results, the Bureau has adopted a scale by means of which the different classes of livestock can be reduced to a unit basis. The scale adopted is the so-called "Alpbestossungsskala," which is as follows:

1 mare with foal	=	3 units
1 stallion	)	= 2 units each *
1 horse over 2 years		
1 cow	)	= 1 unit each
1 bull over 2 years		
1 horse under 2 years		
1 mule		
1 ass		
1 heifer over 2 years)	)	= 5/6 unit each
1 bull of 1-2 years		
1 ox of 1-2 years		
1 heifer of 1/2-1 year)	)	= 1/2 unit each
1 boar		
1 sow		
1 hog(for fattening)		
1 calf	)	= 1/4 unit each
1 hog under 6 months		
1 sheep	)	= 1/5 unit each
1 goat		

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\* The principal reason for counting horses as two units is that they destroy a great deal of grass while on pasture, running around.



There is no doubt that this should be changed considerably to fit modern systems of feeding.

No attempt has been made to enumerate the working animals other than horses. Not only are oxen very frequently used as working animals, but also cows, even if in milk.

But several attempts have been made to ascertain the number of neat cattle belonging to different breeds, and to amend the census schedule in this respect. In 1886 an enquête for this purpose was made along with the census. After long discussions in 1901 and 1906, the proposal to enumerate the cattle according to breeds was finally rejected. It was taken up again, and in 1911 the first census on breeds took place. Unfortunately the question was later dropped from the census schedule.

In the estimate of 1886, the following classes were distinguished: 1, Fleckvieh (spotted cattle), 2, Braunvieh (brown cattle), 3, Bastarde (intermediate).

The census of 1911 divided Fleckvieh into: (a) Rot (red) or Falbfleckvieh (yellow), and (b) Schwarz (black) Fleckvieh; and Braunvieh into: (a) Braun (brown) and Grauvieh (gray), and (b) Eringervieh.

As regards weights and the size of the breeds kept in Switzerland, some information can be found in Handwörterbuch der Schweiz. Volkswirtschaft, article Viehzucht, Vol.III/2, p.1399, where a table is published giving the weights of the cattle exhibited at two federal exhibitions, and also a table containing records of the size of four different breeds as exhibited in 1903. These two exhibitions took place in 1895 and 1903. The weight of the cattle increased considerably in that short period.

Older figures are available in Volkswirtschaftslexikon der Schweiz vol. III-IV, p.354/55. Some very detailed records of live weights of different classes of neat cattle at different ages are published by I. Käppeli in Forschungen auf dem Gebiete der Landwirtschaft. These records also show the variations in the size of the animals at different ages. They are taken partly on farms connected with agricultural colleges, partly from records of breeders' associations. More recent investigations made by government experiment stations are reported in Landwirtschaftliches Jahrbuch der Schweiz, 1922 p. 311.

Even before 1866, several censuses on livestock had been taken by some cantons. For the Canton Bern, for example, figures were available

as far back as 1790. The same is true for the Cantons Glarus and Unterwalden. The Canton Bern has taken a yearly census since 1808. Most of the other cantons started yearly censuses later. These are needed as the basic figures for the compulsory insurance of the livestock. They are not comparable with the federal censuses.

An enumeration of the livestock on farms took place in the "farm census" of 1905. The schedule was much more simple than the one used for the regular livestock censuses, and the enumeration was made in August, in contrast with April for the livestock censuses. This enables one to make certain comparisons of the number of livestock on farms at different times of the year. For goats, as pointed out above, the census in April records a figure much too high, as can be seen from the following table:

1901 April	354,634
1905 August	268,638
1906 April	359,913

For the census on farms, as taken in 1929 (August 22), the Questionnaire was very much enlarged as regards livestock on farms. With some alterations the standard schedule as proposed by the committee on the world census was adopted. It reads as follows: (X indicates the alterations from the world census recommendations)

1. Horses:

- a) Colts and fillies under one year of age
- b) Young stock from 1 to 3 years of age
- c) Stallions 3 years of age and over
- d) Mares (for breeding purposes) over 3 years of age
- X e) Other horses over 3 years of age

2. Asses (total)

X 3. Mules (total)

4. Neat cattle

- a) Calves and heifers under 1 year of age
- X b) Heifers over 1 year of age
- c) Bulls for reproduction over 1 year of age
- d) Oxen over 1 year of age (including bulls no longer used in breeding)
- X e) Cows (cows in milk and others)

5. Sheep

6. Goats (total)



7. Swine

- a) Pigs less than 6 months old
- b) Sows for breeding 6 months old and over
- c) Boars for breeding 6 months old and over
- d) Pigs for fattening

8. Poultry

- a) Chickens of all kinds
- b) Geese
- X c) Ducks
- d) Turkeys

9. Bees

- X a) Beehives with movable honeycombs
- X b) Beehives with fixed honeycombs

10. Silk worms

- a) How many eggs have been developed
- b) How many new cocoons were produced (to be measured in grams)

The principal difference between this 1929 census and the regular livestock censuses is that this is principally a census of livestock on farms, and hence has not included all the livestock in the country. The definition of a farm, however, is to a large extent based on the keeping of livestock (see above, section D), which makes the number of livestock not enumerated very small. It will be important only in the case of horses and poultry.

The other differences were as follows: "Mares and geldings 3 years of age and over" in the world census schedule were subdivided into "Mares (for breeding purposes) over 3 years of age" and "Other horses over 3 years of age." Mules in the world census are split at 2 years of age into two groups, and in the Swiss census are recorded only in total numbers. The Swiss census separates heifers from cows 1 year of age and over, and the world census puts them together and then subdivides them according to whether kept for milk, breeding or other purposes. The Swiss census has a special class for oxen.

The distinction between livestock on farms and livestock not on farms is also made in the regular livestock censuses. Since it has been made on uniform bases in this respect only since 1910, the Federal Office of Statistics does not believe the earlier returns to be reliable in this respect.

The livestock census returns are worked up in a very detailed manner. In the introductions to the volumes (as for example, those for 1926) will be found tables on the number of each class of livestock per square kilometer in each canton. Tables are included, grouping the owners of each class of cattle according to the number they possess, which gives indication as to the size of the herds prevailing in the country. Other tables show the combination of the different classes of livestock kept on the farms. All the important results are worked up and published for each commune.

Of poultry, only three federal censuses have been taken, namely, in the years 1918, 1921 and 1926. For reasons of expediency, these censuses have all been taken in April, along with the censuses on livestock, although the flocks of poultry at that time are not "normal" in size, because of the heavy slaughter during the wintertime. The schedules have been simple. The first one asked for the number of geese, ducks, chickens, turkeys and guinea fowls. For the censuses of 1921 and 1926, still only two classes were listed: "Geese and ducks" and "Chickens of all kinds" (meaning chickens, turkeys and guinea fowls, the chickens amounting to more than 99 percent). The 1918 results can be combined and compared with those of the 1921 and 1926 censuses.

In all three censuses, the owners of poultry were classified as farm-operators or non-farm operators, and the farmers were again divided into "farmers with agriculture as their only source of income," and "farmers with other sources of income (outside agriculture)". These figures show to what an extent poultry is kept by the non-farming population.

As already mentioned, the census of 1929 records the poultry also. As it was taken late in August, when the hatching time was almost over, the figure will represent more closely the "normal stock" for both egg and meat production. According to the instruction attached to the schedule, "for agricultural enterprises," however, it seems that poultry will be recorded for the "farms without land" only if the poultry is kept "as a business," that is, if the poultry itself or its products are sold regularly. Thus the poultry which is kept only for family use by the non-farming population will be excluded.

The censuses on bee-keeping date as far back as 1876. They were taken in connection with the census on livestock in the following years: 1876, 1886, 1896, 1901, 1911, 1918 and 1926. The schedule has been considerably improved since. In 1876 and 1886, only the total number of beehives was asked for. From 1896 on, the number of beehives kept by each individual owner was ascertained, and since 1911 a distinction has been made between the hives with movable honeycombs and those with unmovable honeycombs. The same questions were inserted in the questionnaire of the census of 1929.



In the 1930 United States farm census, provision was made for classifying livestock on the following basis:

- (a) Horses and mules, April 1, 1930.
  - 1. Horse colts born since Jan. 1, 1930.
  - 2. Horse colts born in 1929 (yearlings).
  - 3. Horse colts born in 1928 (2-year olds).
  - 4. Horses born before 1928.
  - 5. Mule colts born since Jan. 1, 1930.
  - 6. Mule colts born in 1929 (yearlings).
  - 7. Mule colts born in 1928 (2-year olds).
  - 8. Mules born before 1928.
  
- (b) Asses and burros, April 1, 1930.
  - 1. Total, all ages.
  
- (c) Hogs and pigs, April 1, 1930.
  - 1. Pigs born since Jan. 1, 1930.
  - 2. Sows and gilts that have farrowed since Jan. 1, or will farrow before June 1, 1930.
  - 3. Other hogs and pigs born before Jan. 1, 1930.
  
- (d) Sheep and lambs, April 1, 1930.
  - 1. Lambs born since Oct. 1, 1929.
  - 2. Rams and wethers born before Oct. 1, 1929.
  - 3. Yearling ewes born between Oct. 1, 1928 and Oct. 1, 1929.
  - 4. Ewes born before Oct. 1, 1928.
  
- (e) Cattle, April 1, 1930.
  - 1. Calves born since Jan. 1, 1930.
  - 2. Steers and bulls born in 1929 (yearlings).
  - 3. Heifers born in 1929 (yearlings).
  - 4. Bulls born before 1929.
  - 5. Steers born in 1928 (2-year olds).
  - 6. Steers born before 1928.
  - 7. Heifers born in 1928, being kept mainly for milk cows (2-year olds).
  - 8. Heifers born in 1928, being kept mainly for beef cows or beef production (2-year olds).
  - 9. Cows and heifers born before 1928, kept mainly for milk production.
  - 10. Cows and heifers born before 1928, kept mainly for beef production.

- (f) Goats and kids, April 1, 1930.
  - 1. Angora goats and kids (all ages).
  - 2. Other goats and kids (all ages).
  
- (g) Chickens and other poultry, April 1, 1930.
  - 1. Chickens over three months old.
  - 2. Chickens raised in 1929.
  - 3. Geese raised in 1929.
  - 4. Ducks raised in 1929.
  - 5. Turkeys raised in 1929.
  
- (h) Bees, April 1, 1930.

It will be apparent that this classification differs considerably from that recommended for the World Census and used by Switzerland with but few changes. It is evident that its classifications are pointed directly at the problem of forecasting numbers to be marketed or available for production of livestock products, and that, in addition, the schedule is largely affected by the need for meeting the situation caused by shifting the date of the census from January to April. In spite of these differences, however, rough comparability will be possible. The United States classifications are probably more precise and more useful than those of the World Census.

#### Comparison in terms of productive animal units\*

Livestock enter into the problem of population and food supply as producers of part of the calories used in human consumption, and as users of part of the plant production that might be human food instead. The output from livestock can be added to that from plants in order to obtain a total figure for food available for consumption. The consumption of plant food by livestock could be measured directly, but the available statistics are not adequate for such a purpose. An alternative is to ascertain the feed intake of each species of livestock at each age and multiply this by the number of them. A rough device for doing this takes the form of "animal units," one such unit representing the average feed intake of one mature cow in the United States.

The bases that have often been used for the conversion of animals of different ages and classes into animal units in the United States and in Switzerland are as follows:

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\* This analysis was developed by Mr. Henry I. Richards.



	United States	Switzerland
	animal units	
1 Horse over 2 years of age	1	2
1 Stallion		2
1 Mare with foal		3
1 Horse under 2 years		1
1 Colt under 1 year	1/4	
1 Colt 1-2 years	1/2	
1 Mule or ass	1	1
1 Cow	1	1
1 Bull over 2 years	1	1
1 Ox over 2 years		1
1 Heifer 1-2 years	1/2	5/6
1 Heifer 1/2-1 year	1/4	1/2
1 Heifer 0-1/2 year	1/4	1/4
1 Bull 1-2 years		5/6
1 Ox 1-2 years		5/6
1 Hog	1/5	
1 Pig	1/10	
1 Sow or boar		1/2
1 Pig for fattening		1/2
1 Pig under 6 months		1/4
1 Sheep	1/7	1/5
1 Lamb	1/14	
1 Goat		1/5
100 hens	1	

The major difference in these two scales is that a mature horse is considered equal to a mature cow in the United States scale, but to two mature cows in the Swiss scale. Other differences will be pointed out later. On the whole, the United States scale seems to agree more closely than the Swiss scale with feed requirements as given in Morrison's "Feeds and Feeding," as shown in the following analysis.\*

\* Dr. Bachman does not consider the foregoing comparison at all satisfactory, but has suggested that it be used as the best at hand, in order to illustrate the procedures involved in such comparisons. The Swiss students of feeding apparently use different units of measurement of food intake from American students.

It should be emphasized in the beginning that this analysis is based upon feed requirements, in terms of net energy therms, or total digestible nutrients, of each class and age of livestock, without relation to the cost of nutrients from different sources. Hogs, for example, are fed almost entirely upon concentrates, while sheep, cattle and horses are fed to a large extent upon roughage. There is naturally some difference in the cost per unit of net energy, or digestible nutrient from these different sources. According to the total digestible nutrients of feeds given by Henry and Morrison, the cost per hundred pounds of digestible nutrients at average farm prices in the United States from 1921 to 1925 inclusive would be \$1.52 for corn and \$1.75 for oats, \$1.26 for alfalfa hay, and \$0.92 for prairie hay. Another phase of the same problem is the utilization on farms of feeds which have practically no market value.

These data are included merely to indicate the possible effect of substituting average cost of nutrients in place of total requirements.

Naturally, also, the amount of digestible nutrients derived from feeds depends to some extent on the animals to which they are fed.

These facts will serve to illustrate one of the limitations of "productive animal units" as here defined and worked out.

#### Horses

On the basis of past observations in the middle west, mountain, and southern and northern Atlantic Coast states, the average weight of horses two years old and over in the United States has been estimated at approximately 1100 pounds.

The average amount of work per horse 2 years old and over in the United States has been taken, for the purpose of estimating feed requirements, as three hours per day. This estimate is probably a little too high, as shown by the following average number of hours worked by work horses on farms in various parts of the country for which "cost route" records are available.

				Average number of hours worked in year
South Dakota,	Kingsburg	County	- 1922 -	810
"	"	"	" - 1923 -	845
"	"	, Brown	" - 1925 -	791
"	"	, Lincoln	" - 1928 -	783



				Average number of hours worked in year (Continued)*	
Kansas, Mc Pherson* County		- 1920 -			767
" " " "		- 1921 -			628
" " " "		- 1922 -			637
Iowa, Iowa		- 1925 -			821
" " " "		- 1926 -			892
" " " "		- 1927 -			870

According to the feeding standard set up by Morrison, an 1100 pound horse doing light work requires 11.0 pounds of digestible nutrients, or therms, per day.

According to the standards set up by Armsby, the net energy requirements for such a horse would be 10.23.

The relative amount of feed fed to growing colts from one to two years of age, and under one year, can be estimated in a number of ways. One is to take available records of the weight of colts at one year and two years of age, and when mature, and work out the relative feed requirements regardless of the final weight. For example, in Feeds and Feeding (p.322), the following weights are given for 35 draft colts at different ages:

Weight at end of one month	345 pounds
" " " " 12 months	1170 "
" " " " 24 "	1590 "
" when full grown	1700 "
Average weight from birth to 12 months	645 "
" " " " " 1-2 years	1380 "

The average digestible nutrients for maintenance and growth, required per day by these horses when colts and when mature, according to Morrison's feeding standards, are as follows:

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\* U.S.D.A. Bulletin No. 1296, "A Study of Farm Organization in Central Kansas."

		Percent of mature horse requirements
From birth to 12 months	8.38	49
" 1 - 2 years	16.14	95
For these horses when mature, working 3 hours per day	17.00	100

Another record of gains in weight, made by 1,071 colts of trotting stock, is given in Feeds and Feeding (p.321), as follows:

Age	Weight at end of period	Period	Average weight
Birth	110		
1 year	644	1st year	377
2 years	908	2nd year	776
4 years	1102		

The total digestible nutrients required by an 1100-pound horse at light work is 11.2 pounds per day. For these colts, the average feed requirements under one year would be 4.52 pounds of total digestible nutrients, and for colts between one and two years, 9.31 pounds. The percentages of mature horse requirements are, therefore, 44 for colts under one year, and 82 for colts from one to two years old.

These percentages for colts under one year agree very closely; but the percentage for draft colts from one to two years of age is somewhat higher than that for trotting colts. Since the average weight of mature horses in the United States is estimated at 1100 pounds, the percentage of mature horse requirements for trotting colts from one to two years of age is probably closer to the actual average for the United States than the one for draft colts. Even the above estimate for trotting colts from one to two years of age may be considered a little too high because colts in the United States may not, on the average, grow as rapidly as these colts.

This is indicated by the records of growth of four percheron fillies and three percheron geldings at the University of Missouri farm, published in Missouri Agricultural Experiment Station Bulletin No. 62, Normal Growth of Domestic Animals. The dams of three colts were worked regularly, 10-14 days after foaling. The colts were, however, given free access to grain a month after foaling, and, when weaned, were eating a small grain allowance regularly. During the first winter, the colts were



given only an amount of feed "sufficient to keep the colts in good growing condition, but not fat." During the second summer, the colts were on blue grass pasture with a small grain allowance once a day.

These growing conditions are probably somewhat better than on the average farm in the United States, but are probably more nearly normal than for the draft colts mentioned above.

At the end of the first year these colts averaged 854 pounds in weight compared with the average of 1170 pounds for draft colts mentioned above. Assuming an average birth weight of 110 pounds, the average weight of these colts during the first year would be 482 pounds.

At the end of the 21st month (28-day months), the fillies weighed 1331 pounds, and at the end of the 22nd month, the gelding weighed 1327 pounds. These are the last dates for which records of weight were obtained. It seems likely, however, that these colts would easily reach a weight of 1650 pounds, when mature. If so, they should attain an average weight of 1450 pounds at the end of the second year, making an average weight of 966 pounds during the second year.

On the basis of these weights, the total digestible nutrients required per day, according to Morrison's feeding studies, would be 6.266 pounds per day during the first year, 11.302 pounds per day during the second year, and 16.5 pounds per day when mature and doing light work. According to these estimates of feed requirements, the colts would require 38 per cent as much feed during the first year as when mature, and 68 per cent as much during the second year.

In view of these estimates of feed requirements, it was decided to consider colts under one year as equivalent to 0.4 of an "animal unit", and colts from one to two years old as equal to 0.75 of an animal unit.

A word, however, needs to be said about the method used in calculating feed requirements. According to Morrison's feeding studies (Feeds and Feeding 18th edition, p.748), horses at light work require 9.0-11.0 pounds of digestible nutrients per day per 1000 pounds of live weight. The mid-point of this range was used in working out the above estimates. These same feeding studies also give the requirements of growing colts over six months per day per 1000 pounds of live weight as 11.0-13.0. Since the feed requirements per pound of live weight decrease as the live weight increases, 13.0 pounds, or the top of the range, were taken as the average feed requirements per day per 1000 pounds live weight for these colts during the first year.

For the same reason, 11.0 pounds per day per 1000 pounds live weight were taken as the feed requirements of colts 2 years old. By straight line interpolations, feed requirements, on the same basis, at the end of the first year, were estimated to be 12.34 pounds per day, or a simple average of 11.7 pounds per day during the second year.

### Cattle

The average live weight of cattle (not including calves) slaughtered under federal inspection in the United States from 1923-1928 was 953 pounds. Cows milked in the United States will probably average about the same weight, or in round numbers, 1000 pounds. The average production per cow kept for milk on January 1, 1925, as estimated by the Bureau of Agricultural Economics for the year 1924, was 5100 pounds. The total digestible nutrients required by a 1000 pound cow producing 5100 pounds of 3.6% butterfat is 12.19 pounds, according to Morrison's feeding standards. This is slightly above the estimated requirements for horses.

The total digestible nutrients required to maintain the average normal growth of Holstein and Ayrshire heifers, as worked out by Eckles, and reported in Feeds and Feeding, p. 433, is as follows:

Age months	Approximate average weight for the period	Pounds of digestible nutrients required per day	Percent of total for mature milk cow on milk
0 - 12	300	5.56	45.6
12 - 24	650	9.10	74.7

The average weight of beef calves in the United States, during their first, second and later years, is probably very similar to the weight of beef steers showing poor growth, as reported in Normal Growth of Domestic Animals (Missouri Agricultural Experiment Station Bulletin No. 62). These weights, together with the feed requirements according to Morrison's feeding standards, are as follows:

Age months	Average weight	Average digestible nutrients per day	Percent of mature steer requirements
0 - 12	229	3.904	32.7
12 - 24	496	9.882	82.7
24 - 48	771	11.951	100.0



A simple average of these percentages of mature animal requirements for beef and dairy calves under one year gives 39.1, and for young beef and dairy cattle one to two years old, 78.7, which correspond very closely to estimates for colts.

According to the net energy requirements for normal growth and milk production worked out by Armsby (Feeds and Feeding, p.125), a 1000 pound cow producing 5100 pounds of milk of 3.6 percent butterfat would require 9.4 therms per day, while dairy calves under 1 year would require 4.06 therms, and those from 1 to 2 years, 6.36 therms per day. The percentage of mature cow requirements on this basis would be 42 for calves under 1 year, and 65 for young cattle from 1 to 2 years.

The average net energy requirement for normal growth of beef calves under one year is given by Armsby as 5.02 therms per day; for young beef cattle from 1 to 2 years old, 8.0 therms per day, and for a beef animal averaging 1025 pounds and gaining 0.7 pounds per day, 9.18 therms per day. The food requirement for calves 1 year of age is 54.7%, and for young beef animals from 1 to 2 years of age, 87.1% of that for a full grown beef animal. These estimates of feed requirements are based upon an estimated average gain in weight of about 450 pounds the first year, and 350 pounds the second year. Probably the average growth of beef cattle in the United States is somewhat lower than this. In fact, the estimates for normal growth of dairy cattle of about 330 pounds the first year, and 300 pounds the second year are about the same as the growth in weight of the steers mentioned above, and seem to be closer to the actual average for all cattle in the United States. It should also be noted that the above estimates for milk cows and mature or nearly mature beef cattle are practically the same.

While these estimates of feed requirements for cattle of different ages vary somewhat, they are, in general, fairly close to the estimated requirements for horses. The same units have therefore been used to convert numbers of young cattle into equivalent numbers of mature cattle, from the standpoint of feed requirements.

#### Swine

According to Armsby (Feeds and Feeding, p. 123), the average net energy requirements for hogs growing at a normal rate from birth to 225 pounds, approximately the average live weight of hogs slaughtered under federal inspection, is 2.2 therms per day. The feeding period on which this estimate is based is eleven months. Dividing 2.2 by 12 and multiplying it by 11 gives an average for 12 months of 2.02 therms per day. This is equal to slightly more than one-fifth of the average dairy requirements for a mature horse or cow.



For sows weighing 300 pounds at the end of the second year and 210 pounds at the end of the first year, the net energy requirements would be 3.35, or slightly more than one-third of the requirements for a mature cow or horse.

These estimates are widely different from those given above in the United States or Switzerland scales of "productive animal units." Apparently the time element has not been taken into consideration. For instance, 10 pigs nearly two months old require about the same amount of feed as a mature horse or cow. But most pigs are grown to a weight of about 225 pounds within a year, and it is a comparison of average feed requirements for a year that is desired in this study, as well as in most farm management studies.

Since the average net energy requirements per day of hogs grown to a weight of 225 pounds are slightly more than one-fifth, and those of a sow slightly more than one-fourth of a mature cow or horse, the best method of converting hogs into "productive animal units" would, therefore, seem to be to take one-fifth of the estimated number of hogs slaughtered, since the increase in requirements of sows above one-fifth would amount, on the average, to only about 0.1 therm per day for all hogs, assuming an average of eight pigs per sow.

#### Sheep

The average weight of sheep and lambs slaughtered under federal inspection from 1924 to 1928 inclusive was 81 pounds (1928 Yearbook, p. 951). And according to an article on The Sheep Industry in the 1923 Yearbook, p. 277, 80 percent of the sheep and lambs marketed are lambs ranging from 4 to 12 months old. If the average weight of these lambs when marketed is taken at 70 pounds, the average weight of sheep marketed would be approximately 125 pounds.

According to the feeding standards set up by Armsby (Feeds and Feeding, p. 124), lambs of wool breeds would reach this weight when about 7 months old, and lambs of mutton breeds when about 6 months old. These requirements are given only for 3, 6, 9, 12 and 18 months. In order to obtain the requirements for intermediate months, these data were plotted on a chart and a smooth line fitted to the individual points. If, now, the feed requirements, given by Armsby, to produce this weight of lamb are converted to equivalent daily feed requirements for a year, lambs of wool breeds would require 0.4197 therms of net energy, and lambs of mutton breeds 0.4730 therms of net energy. These requirements are 44.6 and 50.3 percent respectively of the net energy requirement of a mature 1000 pound cow producing 5100 pounds of milk.



According to Armsby's feeding standards, the lambs of wool breeds would weigh 90 pounds at the end of twelve months, and the lambs of mutton breeds would weigh 115 pounds. The feed requirements of such lambs, according to Armsby, would average approximately .918 therms per day for the wool breeds, and 1.048 therms for the mutton breeds during the first year.

If, now, we consider that ewes over one year will average 125 pounds in weight, and that they gain an average of 25 pounds during a year (consisting of a 10 lbs. lamb, 8 lbs. of wool and 7 lbs. of flesh), the net energy requirements per day, according to Armsby, would be 1.189, or 12.65 percent of a mature cow's requirement. According to Henry and Morrison's standard, however, the requirements would be .1766 pounds of digestible nutrients per day (using average maintenance requirements of coarse and fine wool sheep for 9 months, and requirements for breeding ewes with lamb for 3 months). This is equivalent to 14.52 percent of a mature cow's requirements.

In working up an historical series of "animal units" for sheep, however, some account must also be taken of changes in the age and weight of sheep and lambs marketed during the period. While weights of sheep and lambs now consist of about 80 percent lambs, in earlier years, especially before 1900, very few lambs were marketed. Most of the marketings consisted of sheep 4 to 8 years of age, according to The Sheep Industry, p. 277, U. S. D. A. Yearbook, 1923. During the early period, therefore, most of the lambs must have been kept during an entire year, and should be equivalent to about .10 of an animal unit. Today, however, about 80 percent are probably marketed as lambs, which require probably slightly less than .05 of an animal unit, and the other 20 percent require about .10 of an animal unit, making an average of about .06.

But the lambs that are kept an entire year will normally merely displace an equal number of older sheep that die or are slaughtered during the year. These older sheep that are disposed of should be considered as kept on the farm only half a year.

During the early period, therefore, the number of lambs raised should be considered equivalent to 0.10 of an "animal unit," and an equal number of older sheep should be considered equal to .095 of an "animal unit." This is the same as considering all of the sheep over 1 year on a given census date equal to 0.13 of an "animal unit," and lambs equal to 0.035 or 0.10-0.065.

During the latter period, when only about 20 per cent of the lambs are kept an entire year, displacing an equal number of older sheep, the method of estimating "animal units" would be the number of sheep one year and older times .13 plus  $[(80 \times 0.05) + (20 \times 0.10) - (20 \times 0.065)]$ , or 0.047 times the number of lambs raised.

Since accurate records of the amount of this change in age of sheep marketed are not available for each census year, it has been considered advisable to use only one scale for converting numbers of lambs and sheep to "animal units." This scale is .13 of an animal unit for sheep 1 year and over, and .04 for lambs raised.

#### Chickens

A special analysis has not been made of the feed requirements of chickens. The usual scale of 100 chickens per "animal unit" has been used in this report. It should be noted, however, that the number of chickens on farms, January 1st, in the United States, and not the number raised, is divided by 100.

### Productive Animal Units for Switzerland

#### Horses

The average dressed weight of horses slaughtered in 1927 at public slaughter houses was 270 kg., or 595 pounds. Assuming an average dressing percentage of 50, the average live weight of these horses would have been 1200 pounds. Horses in Switzerland probably work an average of one hour longer per day than in the United States. On this basis, the net energy requirements would be 13.32 therms per day, or 130.2 per cent of the estimated average requirements for horses in the United States. The fact that many horses in Switzerland are used for military service as well as for farm and other work is one reason for estimating longer hours of horse work in Switzerland than in the United States. An average of one-third more work per day may, however, be too great a difference.\* A difference of 20 per cent in feed requirements for mature horses in Switzerland compared with the United States would, however, seem to be reasonable. The total digestible nutrients required, according to Morrison's feeding standards, would be 14.4 pounds per day, or 128 per cent of the estimated average for the United States.

#### Cattle

The average slaughtered weight of cows slaughtered in Switzerland in 1927 was 266 kg., or 586 pounds. Assuming an average dressing per-

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\* No adequate data available in support of any estimate on this point.



centage of 50, the average live weight would have been 1172 pounds. The average net energy requirements for a 1200 pound cow producing 6600 pounds of milk with 3.7% butterfat, the average estimated by the Farmers' Secretariat would be, according to Armsby, 11.26 therms per day, or 115 percent of the average estimated for the United States. The total digestible nutrients required for this, according to Morrison's feeding standards, would be 15.1 pounds per day, or 124 percent of the average for the United States.

Milk cows in Switzerland are also used to some extent for field work in place of horses.

While this apparent excess of feed requirements in Switzerland compared with the United States for mature horses or cattle might not apply to young growing colts or cattle, the average weight of heifers slaughtered in Switzerland suggests that young cattle are also fed heavier than in the United States. The average slaughter weight of heifers slaughtered in 1927 was 251 kgs., or 553 pounds. Assuming a dressing percentage of 50, the live weight would have been about 1100 pounds.

If a "productive animal unit" is defined as the average feed requirements of a mature cow in the United States, the available evidence indicates that the units for horses and cattle in Switzerland should be a fifth larger than in the United States. Practically the same scale of units, however, can be used for hogs and sheep in Switzerland as in the United States.

The following table compares the number of important kinds of livestock and the equivalent number of productive animal units in the United States and Switzerland.

The cattle census in Switzerland is taken in April, while that in the United States has been taken recently on January 1. The difference, however, is probably not large since the peak of the calving period comes in November and December, and many of the calves are slaughtered when only a few weeks or months old. Besides, the increase in number of calves is offset to some extent by a decrease in number of more mature cattle. The increase in number of cattle in Switzerland from January 1 to about April 20 in each of the census years is, therefore, probably less than three percent.

The increase in number of horses, mules and asses in Switzerland since 1916 is due entirely to the increase in number on farms from 111,427 in 1916 to 124,865 in 1926.

Table XVIII. - NUMBER OF HEAD OF IMPORTANT KINDS OF LIVESTOCK AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS IN THE UNITED STATES ON JANUARY 1st AND SWITZERLAND ON APRIL 15 to 22, 1880-1926 \*

		Number of head			
		Cattle (1)		Horses and mules (2)	
		United States	Switzerland	United States	Switzerland
		Thousands		Thousands	
1926	:	:	1,587,399	:	143,522
1925	:	63,462,000	:	23,542,000	:
1921	:	:	1,425,341	:	137,982
1920	:	68,764,000	:	27,283,000	:
1916	:	:	1,615,893	:	139,915
1911	:	:	1,443,483	:	147,279
1910	:	62,000,000	:	27,362,000	:
1906	:	:	1,498,144	:	138,525
1901	:	64,500,000	:	:	127,973
1900	:	:	:	24,642,000	:
1890	:	65,700,000	:	:	:
1880	:	45,400,000	:	:	:
		Equivalent Number of Productive Animal Units			
1926	:	:	1,567,497	:	168,137
1925	:	51,940,000	:	22,920,000	:
1921	:	:	1,406,064	:	159,110
1920	:	56,279,000	:	25,900,000	:
1916	:	:	1,579,057	:	163,316
1911	:	:	1,431,524	:	171,555
1910	:	50,743,000	:	25,609,000	:
1906	:	:	1,473,183	:	161,090
1901	:	:	1,333,613	:	148,568
1900	:	52,789,000	:	23,252,000	:
1896	:	:	:	:	:
1890	:	53,771,000	:	:	:
1880	:	37,157,000	:	:	:

\* Since the census of livestock in Switzerland is taken on or about April 20, the number of livestock reported is probably larger than the number in Switzerland on January 1st of each census year. The number of young stock born between January 1st and the date of the Swiss census probably exceeds the loss in numbers from deaths or slaughtering by a considerable margin. This difference in date of the livestock census in Switzerland and the estimate for the United States should not, however, materially affect the number of productive animal units in each country. Loss of livestock from slaughtering and deaths in Switzerland from January 1st to the date of the census probably offsets the increase in number of livestock born

Footnote continued.



Table XVIII. - NUMBER OF HEAD OF IMPORTANT KINDS OF LIVESTOCK AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS IN THE UNITED STATES ON JANUARY 1st AND SWITZERLAND ON APRIL 15 to 22, 1880-1926 \* (Cont.)

	N u m b e r o f h e a d			
	Swine (3)		Sheep and goats (4)	
	United States	Switzerland	United States	Switzerland
	Thousands		Thousands	
1926	:	637,098	:	458,981
1925	58,228,000	:	41,908,218	:
1921	:	640,091	:	575,392
1920	62,451,000	:	44,256,659	:
1916	:	544,563	:	531,825
1911	:	570,226	:	502,710
1910	57,200,000	:	47,829,795	:
1906	:	548,970	:	572,114
1901	55,700,000	:	555,261	:
1900	:	:	:	:
1890	59,100,000	:	:	:
1880	51,200,000	:	:	:
	Equivalent Number of Productive Animal Units			
1926	:	182,000	:	79,365
1925	13,046,000	:	6,377,000	:
1921	:	184,000	:	96,793
1920	10,752,000	:	6,697,000	:
1916	:	:	:	92,944
1911	:	176,000	:	89,562
1910	8,304,000	:	7,238,000	:
1906	:	:	:	99,356
1901	:	:	:	98,561
1900	5,196,000	:	:	:
1896	:	146,000	:	:
1890	:	:	:	:
1880	:	:	:	:

during this period; since one mature animal is equivalent to a number of head of young stock a few months old.

(1) Number of head of cattle:- United States-- Estimates of the number on farms and elsewhere in the United States on January 1st of each year as published in the United States Department of Agriculture Year-book, 1927, pp.980 and 1061.

Switzerland - As published in the Swiss Census report Schweizerische Statistische Mitteilungen, XIII, Viehzählung der Schweiz, 1926, pp. 218 and 219.

Footnote continued.

Table XVIII. - NUMBER OF HEAD OF IMPORTANT KINDS OF LIVESTOCK AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS IN THE UNITED STATES ON JANUARY 1st AND SWITZERLAND ON APRIL 15 to 22, 1880-1926 \* (Cont.)

		N u m b e r o f h e a d	
		Poultry	
		United States	Switzerland
		Thousands	
1926	:	:	4,176,791
1925	:	424,417.000	:
1921	:	:	3,295,844
1920	:	372,825,000	:
1916	:	:	:
1911	:	:	:
1910	:	359,107,000	:
1906	:	:	:
1901	:	:	:
1900	:	303,255,000	:
1890	:	345,586,000	:
1880	:	:	:
		Equivalent Number of Productive Animal Units	
1926	:	:	41,768
1925	:	5,458,480	:
1921	:	:	32,958
1920	:	3,862,404	:
1916	:	:	:
1911	:	:	:
1910	:	2,025,063	:
1906	:	:	:
1901	:	:	:
1900	:	:	:
1896	:	:	:
1890	:	:	:
1880	:	:	:

Equivalent number of productive animal units:			
Age classification	United States	Switzerland	
	Productive animal units		
2 years old and over	1.00	1.20	
1 to 2 years	0.75	.90	
under 1 year	0.40	.48	

The number of cattle in each of these age groups in the United States was estimated by applying the average percentage in each class, as shown by the 1920 and 1925 census reports, to the estimated total number of cattle in the United States on January 1st

Footnote continued



### Ratio of Livestock to Land

In 1900 and 1910 the number of cattle per farm in the United States was about 50 to 80 percent larger than in Switzerland, while the number of productive animal units of cattle was 30 to 50 percent larger. Since these years, the cattle industry in the United States has been declining, while in Switzerland it has been practically constant.

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of each census year shown above. The number of cattle in the classes listed as 1 year and over in the census reports was divided equally between classes 1 to 2 years and 2 years and over.

The number of cattle in each of the above age groups in Switzerland is given in the Swiss census report. In estimating the number of productive animal units, however, calves under six months kept for slaughtering have been considered as being fed an average of six months and therefore equivalent to only .24 of a productive animal unit.

(2) The number of horses and mules on farms and elsewhere in the United States on January 1st of each year were obtained as follows:

1925 - United States census report of number on farms January 1st plus 1,460,000, the estimated number not on farms according to Dr. O. E. Baker (See changes in utilization of land in the United States Preliminary Report, June, 1926, p.5).

1920 - As reported by the United States Census Bureau.

1910 - Number on farms and not on farms April 15, as reported by the United States Census Bureau less the number of colts under 3-1/2 months (722,000) plus an estimated loss of other horses and mules between January 1st and April 15th, 1910. This loss was estimated at 588,000 by applying the percentage that this period is of an entire year (28.74%) to the number of colts 3-1/2 to 15-1/2 months old (2,092,000), on the assumption that this number of colts is approximately equal to the yearly loss of horses 3-1/2 months and older.

1900 - As reported by the United States Census Bureau. Spring colts were not supposed to be included in the census report, but some undoubtedly were, and the number of colts so included has been assumed to equal the loss of horses from January 1st to June 1st, 1900.

Switzerland - As published in the Swiss census report Schweizerische Statistische Mitteilungen, XIII, Viehzählung der Schweiz, 1926, pp. 218 and 219.

Equivalent number of productive animal units: The scale used in both countries for converting numbers of horses and mules in each age group to equivalent number of productive animal units was the same as for cattle. The number of horses and mules in each age group in the United States was estimated as follows:

Footnote continued.

The number of cattle per acre of land in farms and for other land classifications during these and later years, however, presents an entirely different picture. The number per acre of land in farms in Switzerland in 1906 was about four times as large, and per acre of land in cereals practically thirteen times as large, and per acre of arable land about ten times as large as in the United States in 1900 and 1910.\* The trends in these two countries are also considerably different. The number of cattle per acre of arable land and land in cereals has been increasing in Switzerland but decreasing in the United States. Comparisons of the number of productive animal units in these countries indicate a still greater intensity of cattle production per acre of land in Switzerland as compared with the United States. (See Table XIV).

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1925 - The number of horses and mules on farms under 2 years old were equally divided into classes under 1 year and 1 to 2 years of age. All other horses and mules were assumed to be over 2 years old.

1920 - As reported by the United States Census Bureau for the number on farms. The numbers not on farms were all classified as 2 years and over.

1910 - The number of horses and mules in each age group from 1 to 2 years and under 1 year have been assumed to be the same as reported by the Bureau of the Census for the age groups 3-1/2 to 15-1/2 months. All other horses and mules are considered to be 2 years and older.

1900 - As reported by the United States Census Bureau.

In the Swiss census report all horses under 4 years old are grouped together. One fourth of this number have been classified in each of the age groups under 1 year, and 1 year and under 2 years in estimating the number of productive animal units

Mules of all ages are also reported in only one group. The number of mules, under 1 year, and 1 year and under 2 years of age has consequently been assumed to be the same percentage of all mules as horse colts in these age groups are of all horses.

Footnote continued

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\* The "intensity of livestock production per acre" is of course based on very heavy imports of cereals and concentrates. Take corn for example:

Production 1927	39,000 quintals
Imports	1,549,000 "

This brings out clearly how much farming in Switzerland has developed as a "manufacturing industry" compared with that of the United States.



The average number of horses and mules per farm in the United States was between seven and eight times as large in 1900 and 1910 as in Switzerland in 1906. While figures on the number of farms in Switzerland in 1926 are not available, the number of horses indicates that the average number of horses per farm at this time was probably seven times larger in the United States than in Switzerland.

- (3) Number of head of swine - United States - Estimates of the number on farms and elsewhere in the United States on January 1st of each year as published in the United States Department of Agriculture 1927 Yearbook, p. 1000.

Switzerland - As published in the Swiss census report Schweizerische Statistische Mitteilungen, XIII, Viehzählung der Schweiz, 1926, pp. 218 and 219.

Equivalent number of productive animal units: The scale used in converting numbers of hogs into equivalent number of productive animal units is as follows:

	Estimated average live weight of hogs slaughtered	Equivalent number of productive animal units per hog
United States, approximately	225 pounds	.20
Switzerland, approximately	250 pounds	.25

The equivalent number of hogs of these weights was determined by dividing the estimated total live weight of hogs produced in each country by the above averages. This number in each country was then multiplied by the above units. (See text for further explanation).

- (4) Number of head of sheep and goats - Estimates of the number of sheep on farms and elsewhere in the United States as published in the United States Department of Agriculture 1927 Yearbook, p. 1021, plus the total number of goats in the United States as reported by the Bureau of Census.

Switzerland - As published in the Swiss census report Schweizerische Statistische Mitteilungen, XIII, Viehzählung der Schweiz, 1926, pp. 218 and 219.

Equivalent number of productive animal units: The scale used for converting number of sheep in each country into equivalent number of productive animal units is as follows:

	United States	Switzerland
Lambs (under 1 year)	.10	
Sheep (1 year and over)	.14	
Sheep (no age distinction)		.12
Kid goats	.10	.10
Milking goats		.24
He goats		.24

The number of horses per acre of land in farms, however, seems to be about the same in both countries. The conversion of number of horses and mules and asses to "productive animal units" merely increases slightly the importance of horses in Switzerland compared with the United States.

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The number of ewes and other sheep 1 year and over in the United States was determined as follows;

1925 - The percentage in each of these classes shown by the census was multiplied by the number on farms and elsewhere, estimated by the United States Department of Agriculture.

1920 - Same method of procedure using 1920 census data.

1910 - The percentages determined for 1920 were multiplied by the number of sheep in the United States on January 1st, 1910, estimated by the United States Department of Agriculture. The number of lambs and kid goats in the United States were then estimated by multiplying the above estimated number of ewes and she goats by .7, which is approximately the same percentage of lambs to ewes as reported in the United States census for June 1, 1900.

The number of sheep and goats in Switzerland is reported in the livestock censuses according to the above classification.

(5) The number of head of poultry on farms January 1st was obtained as follows:

1925 - Number of chickens on farms as reported in the 1925 census times the percentage that number of poultry were of the numbers of chickens reported in the 1920 census.

1920 - As reported by the United States Bureau of Census.

1910 - Number of head of poultry on farms April 15, 1910, that were hatched previous to January 1st, 1910, plus an estimated net loss during this period. An estimate of this net loss was obtained by applying the average percentage (23.18%) of annual dressed fowl receipts, for fowls arriving at four large markets, between June 1st and April 15th of each year from 1921-1925, to the total number raised in 1909 (488,468,000) as reported by the United States Census Bureau less 50,000,000, the number of head of poultry hatched between January 1st and April 15th, assumed to have been included in the census reports by mistake. Poultry hatched during this period were not supposed to be included in census totals for April 15th, but some undoubtedly were.

Footnote continued



The upward trend in number of all horses and mules and asses per acre of land in cereals and arable land is even greater when the horses not on farms are excluded, as shown in Table XX.

The average number of swine per farm in the United States in 1900 and 1910 was a little more than four times as large as in Switzerland in 1906. It is probably somewhat less than this now, since the number of swine in Switzerland increased much more between 1906 and 1926 than in the United States.

The number of swine per acre of land in farms and per acre of agricultural land in Switzerland is, however, somewhat higher than in the United States. In 1906, the number in Switzerland per acre of land in farms was around 40 percent higher than in the United States in 1900 or 1910. In 1926 Switzerland had about 50 percent more hogs per acre of agricultural land than the United States in 1925.

1900 - Number of head of poultry as reported by the United States Census Bureau for June 1st, 1900, plus an estimated net loss from January 1st to June 1st, 1900, of 21 percent. This estimate of net loss due to deaths, above the number of poultry hatched between January 1st and June 1st, that were included by mistake, has been assumed to be the same as for 1910.

Switzerland - As published in the Swiss census report.

Equivalent number of productive animal units: The number of poultry reported in the census as raised in the United States and the number reported in Switzerland at the time of each census were divided by 100 to obtain the number of productive animal units.

	1900	
Chickens including		
guinea fowl	233,598,035	32.064
Turkeys	6,599,367	4,672
Geese	5,676,863	75
Ducks	4,807,353	21,508

1890	
	258,871,125
	10,754,060
	8,440,175
	7,544,080

The number of swine per acre of land in cereals in Switzerland in 1906, 1916 and 1926 was, however, around six times as large as in the United States during the same period. In 1926 the number in Switzerland was nearly eight times as large as in the United States in 1925, on the basis of this classification. Since feed for swine ordinarily consists largely of concentrates such as cereals, this relationship is significant. In Switzerland, however, hogs are fed to a large extent upon waste from kitchens, cheese factories, etc.

Conversion of number of hogs to equivalent number of animal units changes these relationships very little. (See Table XX).

The average number of sheep per farm in the United States in 1910 was a little more than three times as large as in Switzerland in 1906. The number per acre of land in farms, however, was more than twice as large in Switzerland as in the United States, and practically seven times as large per acre of land in cereals. In 1926, however, the number per acre of agricultural land was only 60 percent larger in Switzerland than in the United States in 1925.

When converted to productive animal units, practically the same trends and international comparisons exist as for numbers. (See Table XXII).

The average number of poultry per farm in the United States in 1920 and 1925 was about four times greater than in Switzerland in 1921 and 1926. Data for Switzerland are not available for earlier comparisons. The trend in number per farm in the United States, however, has been upward since 1900. (See Table XXIII).

The average number per acre of land in cereals, however, was 4 times greater in Switzerland in 1920 and 1926 than in the United States in 1920 and 1925; and 5 times greater per acre of arable land.

The following table brings out very clearly the larger number of animal units per farm in the United States as compared with Switzerland. At the same time, it shows a much greater intensity of livestock production per acre of land in cereals and per acre of arable land.



Table XIX. - NUMBER OF CATTLE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1880-1926, (1) and (2)

Census year	Number of head			
	Number per farm		Number per acre of land in farms	
	United States	Switzer- land	United States	Switzer- land
1926	:	:	:	:
1925	: 9.960	:	: .068	:
1921	:	:	:	:
1920	: 10,663	:	: .072	:
1916	:	:	:	:
1911	:	:	:	:
1910	: 9.746	:	: .070	:
1906	:	: 6.147	:	: .292
1901	:	:	:	:
1900	: 11.237	:	: .076	:
1890	: 14.393	:	: .105	:
1880	: 11.324	:	: .084	:
	Equivalent number of productive animal units			
1926	:	:	:	:
1925	: 8.152	:	: .056	:
1921	:	:	:	:
1920	: 8.728	:	: .059	:
1916	:	:	:	:
1911	:	:	:	:
1910	: 7.977	:	: .058	:
1906	:	: 6.045	:	: .287
1901	:	:	:	:
1900	: 9.197	:	: .063	:
1890	: 11.780	:	: .086	:
1880	: 9.269	:	: .069	:

- (1) See Tables IX and XVIII for original data and definitions.
- (2) The noncomparability of the "agricultural land" as obtained in the census of 1905 with the figures of 1912 and 1924 is clearly evident in this table.

Table XIX. - NUMBER OF CATTLE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1880-1926, (1) and (2).

(Continued)

Census year	Number of head			
	Number per acre of arable land		Number per acre of agricultural land	
	United States	Switzer- land	United States	Switzer- land
1926	:	3.233	:	.280
1925	.190	:	.079	:
1921	:	:	:	:
1920	.201	:	:	:
1916	:	3.224	:	:
1911	:	:	:	.252
1910	.203	:	:	:
1906	:	2.140	:	.323
1901	:	:	:	:
1900	.232	:	:	:
1890	.502	:	:	:
1880	.280	:	:	:
	Equivalent number of productive animal units			
1926	:	3.193	:	.276
1925	.156	:	.065	:
1921	:	:	:	:
1920	.165	:	:	:
1916	:	3.151	:	:
1911	:	:	:	.250
1910	.167	:	:	:
1906	:	2.104	:	.317
1901	:	:	:	:
1900	.190	:	:	:
1890	.248	:	:	:
1880	.229	:	:	:

(1) See Tables IX and XVIII for original data and definitions.

(2) The noncomparability of the "agricultural land" as obtained in the census of 1905 with the figures of 1912 and 1924 is clearly evident in this table.



Table XX. - NUMBER OF HORSES AND MULES AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1900-1926\*

Census year	Number of head				
	Number per farm:		Number per acre		
	United States	Switzer-land	United States	Switzer-land	of land in farms
1926	:	:	:	:	:
1925	3.695	:	.025	:	:
1921	:	:	:	:	:
1920	4.231	:	.028	:	:
1916	:	:	:	:	:
1911	:	:	:	:	:
1910	4.301	:	.031	:	:
1906	:	.568	:	.027	:
1901	:	:	:	:	:
1900	4.293	:	.029	:	:
Equivalent number of productive animal units					
1926	:	:	:	:	:
1925	3.597	:	.025	:	:
1921	:	:	:	:	:
1920	4.017	:	.027	:	:
1916	:	:	:	:	:
1911	:	:	:	:	:
1910	4.026	:	.029	:	:
1906	:	.661	:	.031	:
1901	:	:	:	:	:
1900	4.051	:	.028	:	:
:	:	:	:	:	:

\* See Tables IX and XVIII for original data and definitions.

Table XX. - NUMBER OF HORSES AND MULES AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1900-1926\*  
(Continued)

Census year	Number of head			
	Number per acre of arable land		Number per acre of agricultural land	
	United States	Switzer- land	United States	Switzer- land
1926	:	: .292	:	: .025
1925	: .071	:	: .029	:
1921	:	:	:	:
1920	: .080	:	:	:
1916	:	: .279	:	:
1911	:	:	:	: .026
1910	: .089	:	:	:
1906	:	: .198	:	: .030
1901	:	:	:	:
1900	: .088	:	:	:
Equivalent number of productive animal units				
1926	:	: .342	:	: .030
1925	: .069	:	: .029	:
1921	:	:	:	:
1920	: .076	:	:	:
1916	:	: .326	:	:
1911	:	:	:	: .030
1910	: .084	:	:	:
1906	:	: .230	:	: .035
1901	:	:	:	:
1900	: .084	:	:	:

\* See Tables IX and XVIII for original data and definitions.



Table XXI. - NUMBER OF SWINE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1880-1926\*

Census year	Number of head			
	Number per farm		Number per acre of land in farms	
	United States	Switzer- land	United States	Switzer- land
1926	:	:	:	:
1925	9.138	:	.063	:
1921	:	:	:	:
1920	9.684	:	.065	:
1916	:	:	:	:
1911	:	:	:	:
1910	8.991	:	.065	:
1906	:	2.253	:	.107
1901	:	:	:	:
1900	9.704	:	.066	:
1890	10.236	:	.075	:
1880	12.771	:	.095	:
	Equivalent number of productive animal units			
1926	:	:	:	:
1925	2.048	:	.014	:
1921	:	:	:	:
1920	1.667	:	.011	:
1916	:	:	:	:
1911	:	.722	:	.034
1910	1.305	:	.009	:
1906	:	:	:	:
1901	:	:	:	:
1900	.905	:	.006	:
1896	:	:	:	:
1890	:	:	:	:
1880	:	:	:	:

\* See Tables IX and XVIII for original data and definitions.

Table XXI. - NUMBER OF SWINE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1880-1926\* (Continued)

Census year	Number of head			
	Number per acre of arable land		Number per acre of agricultural land	
	United States	Switzer- land	United States	Switzer- land
1926	:	1.298	:	.112
1925	.175	:	.072	:
1921	:	:	:	:
1920	.183	:	:	:
1916	:	1.087	:	:
1911	:	:	:	.099
1910	.187	:	:	:
1906	:	.784	:	.118
1901	:	:	:	:
1900	.200	:	:	:
1890	.216	:	:	:
1880	.315	:	:	:
	Equivalent number of productive animal units			
1926	:	.371	:	.032
1925	.039	:	.016	:
1921	:	:	:	:
1920	.032	:	:	:
1916	:	:	:	:
1911	:	:	:	.031
1910	.027	:	:	:
1906	:	:	:	:
1901	:	:	:	:
1900	.019	:	:	:
1896	:	:	:	:
1890	:	:	:	:
1880	:	:	:	:

\* See Tables IX and XVIII for original data and definitions.



Table XXII. - NUMBER OF SHEEP AND GOATS AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1901-1926\*

Census year	Number of head			
	Number per farm		Number per acre of land in farms	
	United States	Switzer- land	United States	Switzer- land
1926				
1925	6.577		.045	
1921				
1920	6.863		.046	
1916				
1911				
1910	7.518		.054	
1906		2.348		.112
1901				
1900				
1890				
1880				
	Equivalent number of productive animal units			
1926				
1925	1.001		.007	
1921				
1920	1.039		.007	
1916				
1911				
1910	1.138		.008	
1906		.408		.019
1901				
1900				
1890				
1880				

\* See Tables IX and XVIII for original data and definitions.

Table XXII. - NUMBER OF SHEEP AND GOATS AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1901-1926\* (Continued)

Census: year	Number of head			
	Number per acre of arable land		Number per acre of agricultural land	
	United States	Switzer- land	United States	Switzer- land
1926	:	.935	:	.081
1925	.126	:	.052	:
1921	:	:	:	:
1920	.129	:	:	:
1916	:	1.061	:	:
1911	:	:	:	.088
1910	.157	:	:	:
1906	:	.817	:	.123
1901	:	:	:	:
1900	:	:	:	:
1890	:	:	:	:
1880	:	:	:	:
	Equivalent number of productive animal units			
1926	:	.162	:	.014
1925	.019	:	.008	:
1921	:	:	:	:
1920	.020	:	:	:
1916	:	.185	:	:
1911	:	:	:	.016
1910	.024	:	:	:
1906	:	.142	:	.021
1901	:	:	:	:
1900	:	:	:	:
1890	:	:	:	:
1880	:	:	:	:

\* See Tables IX and XVIII for original data and definitions.



Table XXIII. - NUMBER OF POULTRY AND EQUIVALENT NUMBER OF PRO-  
DUCTIVE ANIMAL UNITS PER FARM AND PER ACRE OF VARIOUS LAND  
CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1890-1926\*

Census year	Number of head			
	Number per farm		Number per acre	
	United States	Switzer-land	United States	Switzer-land
1926		17.138		
1925	66.610		.459	
1921		13.524		
1920	57.817		.390	
1910	56.450		.408	
1900	52.835		.360	
1890	75.709		.554	
Equivalent number of productive animal units				
1926		.172		.008
1925	.857		.006	
1921		.135		
1920	.599		.004	
1910	.318		.002	
1900				
1890				

Census year	Number of head			
	Number per acre of arable land		Number per acre of agricultural land	
	United States	Switzer-land	United States	Switzer-land
1926		8.507		.735
1925	1.277		.531	
1921				
1920	1.094			
1910	1.180			
1900	1.093			
1890	1.592			
Equivalent number of productive animal units				
1926		.085		.007
1925	.016		.007	
1921				
1920	.011			
1910	.007			
1900				
1890				

\* See Tables IX and XVIII for original data and definitions.

Table XXIV. - EQUIVALENT TOTAL NUMBER OF PRODUCTIVE ANIMAL UNITS OF LIVESTOCK AND POULTRY AND THE NUMBER PER FARM AND PER ACRE OF VARIOUS LAND CLASSIFICATIONS IN THE UNITED STATES AND SWITZERLAND, 1910-1926\*

Census year	Estimated number of productive animal units		Number of productive animal units	
	United States	Switzerland	United States	Switzerland
1926		2,038,767		
1925	99,741,480		15.654	
1921		1,878,925		
1920	103,490,404		16,049	
1910	93,919,063		14,764	

Census year	Number of productive animal units					
	Per acre of land in farms		Per acre of arable land		Per acre of agricultural land	
	United States	Switzerland	United States	Switzerland	United States	Switzerland
1926			4.153			.359
1925	.108		.300		.125	
1921						
1920	.108		.304		.127	
1910	.107		.309		.126	

\* See Tables IX and XVIII for original data and definitions.



M. Ratio of Livestock to Population and Agricultural Workers

The number of head of cattle per capita of the total population was about 30 per cent less in Switzerland in 1926 than in the United States in 1925. In earlier census years, the per cent was much lower. The trend in number of cattle per capita in the United States has been definitely downward since 1890, while in Switzerland the number per capita has remained practically constant. The trend in number per capita of the farm population and per person gainfully employed in agriculture, on the other hand, has been upward in the United States in recent years, but slightly downward in Switzerland. (See Table XXV.)

Numbers of cattle do not furnish a very good basis for comparing the relative importance of the cattle industry in the two countries, if the foregoing analysis of feed requirements and production per head of cattle in Switzerland and the United States is correct. When cattle of all ages are converted to equivalent number of productive animal units in the United States as described above, the relative importance of the cattle industry in Switzerland compared with the United States is increased, as shown in Table XIX. It should be noted here, that when cattle are expressed in terms of productive animal units, the effect of difference in date of census is largely removed, since mature cattle slaughtered between January 1st and April 13th to 21st are considered equivalent to about four times their number of calves under six months old.

The average number of horses and mules and asses per capita of the total population in the United States in 1925 was slightly more than 5 times as large as in Switzerland in 1926. For earlier census years, the number per capita in the United States is even larger with respect to Switzerland. The trend has been downward in the United States since 1900, especially since 1920, while in Switzerland it has been practically constant with a slight increase from 1921 to 1926. The average number of horses per capita of the farm population is considerably larger than for the total population, but shows about the same relation between the two countries. The trend in number per capita in the United States since 1910 is, however, only slightly downward, due to the decrease in farm population.

The number of productive animal units of horses and mules per capita of each of the above population groups tells much the same story as the number of these animals. The conversion to productive animal units merely increases the number in Switzerland with relation to the United States.

The difference in date of census for the two countries probably caused very little difference in total number of horses.

While the estimated numbers of persons gainfully employed in agriculture in Switzerland and the United States are not strictly comparable, it is interesting to note that in 1910 and 1920 there were between two and a half and three horses per person so employed in the United States, while in Switzerland there was only one horse for every three persons so classified. (See Table XXVI).

The average number of swine per capita of the total population in the United States in 1925 was slightly more than three times as large as in Switzerland in 1926. The number per capita in Switzerland in 1921 and 1926, however, was somewhat higher than in 1906, 1911 and 1916, while in the United States the number per capita has been steadily increasing since 1880. The number of hogs per capita of the farm population in the United States in 1925 was also more than three times as large as in Switzerland in 1921. The trend in Switzerland under this classification has been definitely upward, while for the United States the number in 1920 and 1925 was about 10 per cent above 1910. It should be noted, however, that in 1926, 23.9 per cent of the hogs in Switzerland were not kept on farms. The number of hogs on farms per capita of the farm population and per persons gainfully employed in agriculture is, therefore, considerably lower than shown in the tables below. Other relationships can be seen in table XXVII.

The number of swine on farms at any particular time does not furnish a very accurate basis for comparing the relation of this industry to various population groups. Probably a fairly large number of pigs are born and slaughtered within the census year. Besides, the number of swine in Switzerland was probably considerably larger on the date of each census than on January 1 of the same year.

When the estimated production of pork in each country is converted into equivalent number of productive animal units on the basis of feed requirements, as described above, the effect of the difference in date of census disappears. On this basis, the relative importance of swine in Switzerland with relation to the United States is slightly greater than shown by comparison of the number of hogs in spite of the effect of difference in date of census. (See Table XXVII.)

The number of sheep and goats per capita of the total population was about three times as large in the United States in 1920 and 1925 as in Switzerland in 1921 and 1926. The trend in both countries has been downward in recent years, but more rapidly in the United States than in Switzerland.

The number per capita of the farm population was also about three times as large in the United States in 1920 and 1925 as in Switzerland. The trend, however, is not so sharply downward in the United States as per capita of total population.



Numbers of sheep and goats in the United States and Switzerland, as reported in this table, furnish a poor basis for comparison of this industry in the two countries. The number in Switzerland shown here is probably somewhat larger than the number on January 1 of the same years. Besides, goats kept for milk constitute a fairly large proportion of the number in this classification in Switzerland, and they probably require more feed per head than in the United States. When converted to productive animal units, these differences tend to disappear. The relative importance of this industry in Switzerland compared with the United States is, however, increased by this process. The trends in each country are about the same as pointed out for number of head. (See Table XXVIII).

The number of poultry per capita of the total population was nearly four times as large in the United States in 1925 as in Switzerland in 1926. The relationship is similar, per capita of farm population. Data are not available in Switzerland for comparisons previous to 1921. Since the main hatching period in Switzerland does not start until about May 1, the difference in date of census in the United States and Switzerland should not materially affect the results. The estimated number of equivalent animal units is again a better basis for comparing the relation of this industry to the population in both countries.

In converting numbers to animal units, the total number of poultry raised in the United States, as reported in the census, and the total number in Switzerland on the census date were divided by 100. The estimated number raised in the United States is considerably higher than the number on farms January 1, but the number in Switzerland on the date of the census was probably close to the actual number raised. However, it should be noted that no account is taken here of differences in weight of birds or production of eggs per hen. In 1925 the average production of eggs per chicken on farms in the United States was 56.4, according to the United States farm census reports, compared with an average of approximately 70 eggs per chicken on farms in Switzerland in 1926. Consequently, the estimates of productive animal units for Switzerland is probably too low. (See Table XXIV.)

Table XXV. - NUMBER OF HEAD OF CATTLE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1880-1926\*

Census year	Number of head per capita of			
	Total population		Rural population	
	United States	Switzer-land	United States	Switzer-land
1926		.401		
1925	.554			
1921		.367		1.589
1920	.650		1.620	
1916		.416		1.781
1911		.381		1.573
1910	.674		1.489	
1906		.421		1.607
1901	.849	.401	1.641	1.416
1890	1.044		1.831	
1880	.905			
	Equivalent number of productive animal units			
1926		.396		
1925	.453			
1921		.362		1.568
1920	.532		1.326	
1916		.407		1.741
1911		.378		1.560
1910	.552		1.219	
1906		.414		1.581
1901		.399		1.409
1900	.695		1.343	
1890	.854		1.498	
1880	.741			

\* See Tables III and XVIII for original data and definitions.



Table XXV. - NUMBER OF HEAD OF CATTLE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1880-1926\* (Continued)

Census year	Number of head per capita of			
	Farm population		Persons gainfully employed in agriculture (15 years and over)	
	United States	Switzerland	United States	Switzerland
1926				
1925	2.190			
1921		1.424		3.059
1920	2.218		6.763	
1916		1.613		3.476
1911		1.439		3.113
1910	1.975		6.390	
1906		1.457		3.228
1901		1.263		2.883
1890				
1880				
	Equivalent number of productive animal units			
1926				
1925	1.792			
1921		1.405		3.017
1920	1.815		5.535	
1916		1.576		3.396
1911		1.427		3.087
1910	1.616		5.230	
1906		1.433		3.174
1901		1.257		2.868
1900				
1890				
1880				

\* See Tables III and XVIII for original data and definitions.

Table XXVI. - NUMBER OF HEAD OF HORSES AND MULES AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1900-1926\*

Census year	Number of head per capita of			
	Total population		Rural population	
	United States	Switzer-land	United States	Switzer-land
1926		.036		
1925	.206			
1921		.036		.154
1920	.258		.643	
1916		.036		.154
1911		.039		.160
1910	.298		.657	
1906		.039		.149
1901		.038		.135
1900	.324		.627	
1890				
1880				
	Equivalent number of productive animal units			
1926		.042		
1925	.200			
1921		.041		.177
1920	.245		.610	
1916		.042		.180
1911		.045		.187
1910	.278		.615	
1906		.045		.173
1901		.044		.157
1900	.306		.591	
1890				
1880				

\* See Tables III and XVIII for original data and definitions.



Table XXVI.— NUMBER OF HEAD OF HORSES AND MULES AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1900-1926\* (Continued)

Census year	Number of head per capita of			
	Farm population		Persons gainfully employed in agriculture (15 years and over)	
	United States	Switzerland	United States	Switzerland
1926				
1925	.812			
1921		.133		.296
1920	.880		2.683	
1916		.140		.301
1911		.147		.318
1910	.871		2.820	
1906		.135		.298
1901		.121		.275
1900				
1890				
1880				
	Equivalent number of productive animal units			
1926				
1925	.791			
1921		.159		.343
1920	.835		2.547	
1916		.163		.351
1911		.171		.370
1910	.816		2.639	
1906		.157		.347
1901		.140		.320
1900				
1890				
1880				

\* See Tables III and XVIII for original data and definitions.

Table XXVII. - NUMBER OF HEAD OF SWINE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1880-1926.\*

Census year	Number of head per capita of			
	Total population		Rural population	
	United States	Switzer-land	United States	Switzer-land
1926		.161		.709
1925	.508			
1921		.165		.714
1920	.591		1.472	
1916		.140		.600
1911		.151		.621
1910	.622		1.374	
1906		.154		.589
1901	.733	.166	1.417	.587
1890	.939		1.647	
1880	1.021			
	Equivalent number of productive animal units			
1926		.046		
1925	.114			
1921		.047		.205
1920	.102		.253	
1916				
1911		.046		.192
1910	.090		.199	
1906				
1901				
1900	.068		.132	
1896		.046		.152
1890				
1880				

\* See Tables III and XVIII for original data and definitions.



Table XXVII. - NUMBER OF HEAD OF SWINE AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1880-1926.\*  
(Continued)

Census year	Number of head per capita of			
	Farm population:		Persons gainfully employed in agriculture (15 years and over)	
	United States	Switzer- land	United States	Switzer- land
1926	:	:	:	:
1925	: 2.009	:	:	:
1921	:	: .640	:	: 1.374
1920	: 2.015	:	: 6.142	:
1916	:	: .544	:	: 1.171
1911	:	: .568	:	: 1.230
1910	: 1.822	:	: 5.895	:
1906	:	: .534	:	: 1.183
1901	:	: .523	:	: 1.194
1890	:	:	:	:
1880	:	:	:	:
		Equivalent number of productive animal units		
1926	:	:	:	:
1925	: .450	:	:	:
1921	:	: .184	:	: .395
1920	: .347	:	: 1.057	:
1916	:	:	:	:
1911	:	: .175	:	: .380
1910	: .264	:	: .856	:
1906	:	:	:	:
1901	:	:	:	:
1900	:	:	:	:
1896	:	: .133	:	: .313
1890	:	:	:	:
1880	:	:	:	:

\* See Tables III and XVIII for original data and definitions.

Table XXVIII. - NUMBER OF HEAD OF SHEEP AND GOATS AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1901-1926.\*

Census year	Number of head per capita of			
	Total population		Rural population	
	United States	Switzer-land	United States	Switzer-land
1926		.116		
1925	.365			
1921		.148		.641
1920	.418		1.042	
1916		.137		.586
1911		.133		.548
1910	.520		1.148	
1906		.161		.614
1901		.172		.606
1900				
1890				
1880				
		Equivalent number of productive animal units		
1926		.020		
1925	.056			
1921		.025		.108
1920	.063		.158	
1916		.024		.102
1911		.024		.098
1910	.079		.174	
1906		.028		.107
1901		.030		.104
1900				
1890				
1880				

\* See Tables III and XVIII for original data and definitions.



Table XXVIII. - NUMBER OF HEAD OF SHEEP AND GOATS AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1901-1926.\*  
(Continued)

Census year	Number of head per capita of			
	Farm population		Persons gainfully employed in agriculture (15 years and over)	
	United States	Switzer- land	United States	Switzer- land
1926				
1925	1.446			
1921		.575		1.235
1920	1.427		4.352	
1916		.531		1.144
1911		.501		1.084
1910	1.523		4.929	
1906		.556		1.233
1901		.541		1.235
1900				
1890				
1880				
	Equivalent number of productive animal units			
1926				
1925	.220			
1921		.097		.208
1920	.216		.659	
1916		.093		.200
1911		.089		.193
1910	.231		.746	
1906		.097		.214
1901		.093		.212
1900				
1890				
1880				

\* See Tables III and XVIII for original data and definitions.

Table XXIX. - NUMBER OF HEAD OF POULTRY AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1890-1926.\*

Census year	Number of head per capita of			
	Total population:		Rural population:	
	United States	Switzer- land	United States	Switzer- land
1926		1.055		
1925	3.705			
1921		.848		3.674
1920	3.527		8.785	
1910	3.905		8.625	
1900	3.990		7.715	
1890	5.490		9.629	
1880				
	Equivalent number of productive animal units			
1926		.011		
1925	.048			
1921		.008		.037
1920	.037		.091	
1910	.022		.049	
1900				
1890				
1880				

\* See Tables III and XVIII for original data and definitions.



Table XXIX. - NUMBER OF HEAD OF POULTRY AND EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS PER CAPITA OF TOTAL, RURAL, AND FARM POPULATION, AND PER PERSON GAINFULLY EMPLOYED IN AGRICULTURE IN THE UNITED STATES AND SWITZERLAND, 1890-1926\* (Continued)

Census year	Number of head per capita of			
	Farm population		Persons gainfully employed in agriculture (15 years and over)	
	United States	Switzerland	United States	Switzerland
1926				
1925	14.644			
1921		3.294		7.073
1920	12.027		36.665	
1910	11.437		37.012	
1900				
1890				
1880				
	Equivalent number of productive animal units			
1926				
1925	.188			
1921		.033		.071
1920	.125		.380	
1910	.064		.209	
1900				
1890				
1880				

\* See Tables III and XVIII for original data and definitions.

Table XXX. - EQUIVALENT NUMBER OF PRODUCTIVE ANIMAL UNITS OF LIVESTOCK AND POULTRY PER CAPITA OF VARIOUS POPULATION GROUPS IN THE UNITED STATES AND SWITZERLAND, 1880-1926\*

Census year	Productive animal units		Total population		Rural population	
	United States	Switzerland	United States	Switzerland	United States	Switzerland
1926		2,038,767		.515		
1925	99,741,480		.871			
1921		1,878,925		.484		2.094
1920	103,490,404		.979		2.439	
1910	93,919,063		1.021		2.256	

Census year	Farm population		Persons gainfully employed in agriculture (15 years and over)	
	United States	Switzerland	United States	Switzerland
1926				
1925	3.442			
1921		1.876		4.031
1920	3.338		10.178	
1910	2.991		9.680	

\* See Tables III and XVIII for original data and definitions.



## N. Crop Yields and Production

Sources of material for this subject have been listed under different heads above.

No. federal census has ever been taken in Switzerland on yields of crops and total production. And although in the world census the collection of data on production was urged upon the governments as its principal objective, these recommendations were disregarded by the Swiss authorities in the census of 1929. Only in regard to wood and timber were production questions inserted in the schedule.

The reason for this policy is that Switzerland has developed another procedure for obtaining production data. When the Secretariat in Brougg was founded in 1898, partly with government subsidy, it undertook the task of estimating the crop production, and since 1909 it has been in charge of furnishing the figures asked for by the International Institute of Agriculture in Rome. For this purpose, it has set up a very extensive crop reporting service. About 9000 reporters all over the country are used in this work. The questionnaires are prepared by the office in Brougg. The method followed is the same as is recommended by the Institute of Agriculture in Rome. The reporters are asked to estimate the yield as a percentage figure of the average yield of the last ten years. The final results are published yearly in the *Statistisches Jahrbuch*, and in *Statistische Erhebungen und Schätzungen*, 1923 ff., and elsewhere. The actual yield figures are obtained by an inquiry with about 1000 reporters, after the harvest. The yield figure has to be stated in quintals (100 kilograms) per hectare as well as in a percentage figure. On the basis of these reports the Secretariat computes the final estimate of production. The *Statistisches Jahrbuch* contains a yearly average yield figure only for certain selected crops and for the country as a whole, but the *Statistische Erhebungen* gives the yield per hectare for the different regions of the country and for a somewhat longer list of crops. Both sources contain also the final estimates of total production. With respect to the accuracy of the percentage estimates of the reporters, it is the experience of the Secretariat that they are usually too low.

Still more difficulties arise with the figures on fruit production. The method used by the Secretariat in its compilation has been explained by its collaborator, Dr. Howald. Although the office is fully aware of the unreliability of the crop reporters' percentage estimates of fruit production, it has derived its estimates by applying these percentage estimates to a "normal fruit crop" which it has worked out. This "normal fruit crop" is based on an estimate of the number of fruit trees and an estimate of the average yield per tree. The number of fruit trees is based on figures from the bookkeeping records collected annually by the Secretariat. The number of trees per hectare for each type of farm, on those farms keeping books, is multiplied by the total number of hectares

in the farms of each type. The representativeness of the farms keeping books is much to be doubted. Still more doubt could be expressed concerning the average yields used, which are computed partly from the production statistics of the Canton Bern and partly from private sources.

A second method used by the Secretariat to estimate the fruit production is also based on the farm bookkeeping records. First, the value of the total production of fruit is estimated. This gross value includes an allowance for the value resulting from growth of the fruit trees, and also the value of the cider made from the fruit. To get the gross value figure desired for the census of production, two items are deducted, first, the value added by growth of the trees, and second, the value of the cider in excess of the fruit from which it is made (value added by manufacture). The remaining figure for gross value, which can be worked up only after the bookkeeping reports are all in and analyzed, is then divided by a weighted average farm price in order to obtain the number of quintals of fruits harvested. Although many estimates are also involved in this method, the Secretariat is of the opinion that the results are more reliable than those obtained by the first method. The differences are sometimes very considerable, as shown by the following table:

Fruit crop (in quintals)		
	As returned by the crop reporters on the basis of the "normal fruit crop"	As computed on the basis of the estimated gross return
1914	5,629,000	7,224,000
1917	5,902,000	9,328,000
1919	6,509,000	11,840,000
1922	6,901,000	11,663,000

The first series of figures is worked out merely as a preliminary estimate. The second series is published in the Statistische Erhebungen.

Data are already available on the number of fruit trees obtained in the census of 1929. The census schedule included a question for the number of ten different kinds of fruit trees, but unfortunately it did not attempt to obtain records of the number of those in bearing age. It also did not include the trees in private yards, but only those on farms. In keeping with the general policy, no question was inserted as to the yield per tree or even the total amount of fruit harvested.

The publication gives much detail, and several maps are worked out indicating the distribution of trees over the country.



As to the reliability of the figures, the Statistical Office points out that the results are very unsatisfactory. There are good reasons to believe that the figures obtained are closer to the number of trees in bearing age than to the actual number of fruit trees. This conclusion is reached upon comparisons made between the results of the census on fruit trees taken by the Canton of Bern in May 1928, the estimate of Dr. Howald, and the census figures obtained.

Trees	Census of Bern	Federal Census
Apple	1,207,179	947,723
Pear	327,177	248,889
Plum	432,817	255,576

Although these figures are not strictly comparable (the census of Bern included the trees in private yards), the difference is too great to be explained by this fact alone.

Dr. Howald's estimate amounts to 12,500,000 trees in bearing age, while the corresponding number revealed by the 1929 census is 10,840,615. Considering that the number of bearing trees represents (according to Howald), on the average, about 65 per cent of the total number, the difference is surprisingly high.

Independent of the Secretariat in Brougg, and for a much longer period, the Statistical Office of the Canton Bern has been collecting data on yields and production in that canton. It started this work in 1885, and is still proceeding on the lines then adopted. Unfortunately, the Secretariat does not give its estimates for each canton, which makes a check of the results obtained by these two offices impossible. The method used by the Statistical Office of Bern is as follows: In the fall, questionnaires are sent to the commune authorities asking them to answer very carefully the questions on the blank. These questions are very simple such as: "How was the quality and quantity of the crop in your commune?\*", and "What was the yield per Juchart?" (The Juchart is the old measure used commonly in Switzerland). The office converts the reports into the official measure, the hectare. (One Juchart = 36 ares = 0.36 hectares). Such questions have to be answered for all the different kinds of cereals individually; for potatoes, all beets and carrots; for lucerne, clover, etc.; for cabbage, beans, rape, flax, chicory, tobacco, etc. In regard to fruits, the reporter has to state the average yield per tree for each different kind of fruit tree.

Certain general information of importance to yields is also asked for, such as the general weather conditions, the date and hours of hailstorms, and the damage done to the crops by them. Other questions relate to the

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\* To be answered with "very good," "good," "medium," "bad," "very bad."



condition of agriculture in general, such as the number of cooperative associations formed or dissolved, etc. The results of these inquiries are tabulated by the Statistical Office and published usually for two years together in one pamphlet. These data constitute by far the most complete record on yields and production obtainable in Switzerland for such a long period of years.\* They of course have their defects also. First, the changes in the acreage of different crops are taken into account every five years only, at the time the new acreage census is taken. This may affect the yearly figures on production very considerably. The figures on yields per hectare of the different crops are probably the most reliable yield data obtained in Switzerland. The yields of the fruit trees are less satisfactory, and the total production of fruits is absolutely unreliable, since it has been based, until the present, on the census of fruit trees taken in 1888. A new census was taken in 1928, which will permit the production to be estimated more accurately.

Several other cantons have conducted inquiries on agricultural production along the same lines employed by the Canton Bern, for shorter or longer periods. The Canton Zürich has a complete series of figures for the years 1883 to 1907, the Canton de Vaud from the eighties to 1919. The results can be found partly in separate publications and partly in the *Statistisches Jahrbuch*. The Cantons Aargau, Schaffhausen, Fribourg and Thurgau also have some production statistics.

The only crop for which the Federal Office has thought it worthwhile to collect and publish records of production are grapes, or better, their product, wine. Several cantons very early started to collect data on this important crop.\*\* Later on, these individual reports were collected by the Federal Office and made into tables. These give the yield of wine in hectoliters per hectare, and also the total production in each canton. They also show how much wine was made from red grapes and how much from white ones. The method applied by the cantons in collecting the figures is uniform in that in all cantons the communal authorities are in charge of supplying the data to the cantonal government. The schedules vary considerably. As a curiosity, it should be mentioned that the Cantons Bern and Neuchâtel use an old measure, the "Mannwerk" or "ouvrier" (area being worked by one man), which differs in its size by cantons, in Neuchâtel the conversion equivalent being 3.52 ares, in the Canton Bern, 4.5 ares. For the official publication of the figures, these data are converted into hectares.

The tables in the Statistical Yearbook are not entirely complete for several years, since not all cantons have furnished data. This does

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\* For a table of the results from 1885-1912, see *Mitteilungen des Bernischen Statistischen Bureaus*, 1915/I, p. 126 ff.

\*\* Schaffhausen in 1858, Neuchâtel 1884, Bern 1874.



not affect the results very much, however, since in these cantons the production of wine is very small.

In the United States, the farm census schedule provides for the collection every ten years of data from each farm operator on the number of acres of each crop harvested and the total quantity harvested, from which data yields can be computed. In addition, the United States Department of Agriculture maintains a crop reporting service, which forms the basis for annual crop production estimates. The work is now carried on by what is known as the Division of Crop and Livestock Estimates, a part of the Bureau of Agricultural Economics.

The several government crop reports include many items, among the most important of which are annual reports by states and for the United States of acreage planted to different crops, estimates of the condition of growing crops as a percentage of normal, forecasts of yields per acre, and total prospective production during the growing season, yields per acre, and total production at or near harvest time, percentage of crops shipped out of counties where grown, stocks of grain, etc., remaining on farms or in country mills and elevators.

The International Institute of Agriculture recommended two methods of determining crop production for the World Census. One method was to ask each farm operator to state the area of land devoted to each crop, and then estimate, by means of a special investigation conducted by experts, the average yield of these crops per unit of area, for each of the geographical units for which the census data are compiled. The respective areas multiplied by the average yield will give the total quantity of each product in the census year. This method is similar to the one employed in the Swiss Census for 1929 as explained above - average yields are reported by crop reporters to experts.

The second method recommended by the Institute was to ask "each farm operator to state the total quantity of each crop harvested on the area reported by him." This method has been followed in the United States census for 1930.

Table XXXI, following, presents a comparison of United States and Swiss yields for farm crops grown in both. The averages appear to sum consistently.

Table XXXI. - ACREAGE, YIELD PER ACRE, AND PRODUCTION IN THE UNITED STATES AND SWITZERLAND, AVERAGE 1909-1913, 1921-1925, ANNUAL, 1926 and 1927.\*

	Acreage			
	Aver- age 1909- 13	Aver- age 1921- 25	1926	1927
	: 1000 acres ;			
<u>Wheat</u>				
United States	: 47,097	: 58,092	: 56,337	: 58,784
Switzerland	: 105	: 110	: 127	: 127
<u>Rye</u>				
United States	: 2,236	: 4,899	: 3,578	: 3,648
Switzerland	: 60	: 48	: 49	: 49
<u>Oats</u>				
United States	: 37,357	: 42,850	: 44,177	: 41,941
Switzerland	: 81	: 51	: 51	: 51
<u>Potatoes</u>				
United States	: 3,677	: 3,697	: 3,122	: 3,476
Switzerland	: (1) 115	: 111	: 118	: 118

\* U. S. D. A. Yearbook, 1928.  
 (1) 3-year average.



Table XXXI.- ACREAGE, YIELD PER ACRE, AND PRODUCTION IN THE UNITED STATES AND SWITZERLAND, AVERAGE 1909-1913, 1921-1925, ANNUAL, 1926 and 1927.\*

(Continued)

	Yield per acre			
	Aver- age 1909- 13	Aver- age 1921- 25	1926	1927
	bushels:			
<u>Wheat</u>				
United States	14.7	13.9	14.8	14.9
Switzerland	31.6	30.1	33.4	32.4
<u>Rye</u>				
United States	16.1	13.8	11.4	15.9
Switzerland	29.7	32.6	32.3	32.4
<u>Oats</u>				
United States	30.6	30.9	28.2	28.2
Switzerland	59.1	54.7	60.9	56.5
<u>Potatoes</u>				
United States	97.3	107.5	113.5	115.9
Switzerland	(1) 214.5	217.1	189.9	216.6

\* U. S. D. A. Yearbook, 1928.

(1) 3-year average.

Table XXXI. - ACREAGE, YIELD PER ACRE, AND PRODUCTION IN THE UNITED STATES AND SWITZERLAND, AVERAGE 1909-1913, 1921-1925, ANNUAL, 1926 and 1927.\*

(Continued)

	Production			
	Average	Average		
	1909-	1921-	1926	1927
	13	25		
	1000 bushels			
<u>Wheat</u>				
United States	690,108	804,151	831,040	878,374
Switzerland	3,314	3,314	4,244	4,119
<u>Rye</u>				
United States	36,093	68,007	40,795	58,164
Switzerland	1,783	1,563	1,583	1,589
<u>Oats</u>				
United States	1,143,407	1,318,021	1,246,848	1,182,594
Switzerland	4,784	2,790	3,107	2,880
<u>Potatoes</u>				
United States	357,699	395,242	354,328	402,741
Switzerland	(2) 24,664	24,103	22,413	25,554

\* U. S. D. A. Yearbook, 1928.

(2) 4-year average.



## O. Ratio of Crop Production to Livestock

It would be desirable, if possible, to separate animal from human food for each country, and then establish a ratio of animal feed input to number of animal units. This would lead to determining comparative efficiencies in feed consumption and changes in the same. The United States census of 1910 contained inquiries directed at ascertaining what proportion of the various crops was fed to livestock. It has not been attempted in the later censuses. The data available for recent years on this point have been obtained by the Bureau of Crop and Livestock Estimates, and are merely estimates. No statistics are available on this point for Switzerland. There is published, however, a yearly estimate of the amount of milk fed to livestock. Estimates of the amount of crops fed to livestock have been made by the Secretariat for the purpose of computing the tables on production and consumption of food in Switzerland. (See section V.)

The World Census schedule recommended by the International Institute of Agriculture does not provide for obtaining data on the quantity of crops fed to livestock; only the total production of each crop is asked for. The production of crops ordinarily used for feeding animals, such as forage crops, corn, oats and barley, can of course be separated from the production of crops used primarily for human food or industrial purposes, and if combined with data on exports and imports of crops, rough estimates of the consumption of feed crops by animals could be made. The weakness in this method of procedure would be the variations between countries in the use of wheat, corn, barley, potatoes and other crops for human food. However, in most countries, budgetary studies of human food consumption should furnish a fairly reliable basis for eliminating most of the effect of variation in human food consumption upon estimates of feed crops consumed by livestock on the above basis. A much more important limiting factor is the amount of feed obtained by livestock on pasture.

## P. Livestock Production

Sources listed in Part I are Landwirtschaftliches Jahrbuch, Annuaire Agricole de la Suisse; Publications 1-99 and Statistiques et Evaluations Agricoles under Union Suisse des Paysans; Statistisches Jahrbuch der Schweiz, under the Eidgenössisches Departement des Innern; Wirtschaftliche und Sozialstatistische Mitteilungen, under the Volkswirtschaftsdepartement; and Beiträge zur Statistik der Schweizerischen Eidgenossenschaft, under the Departement des Innern.

Other sources of information, two of which are cantonal publications, are as follows:

- Forschungen auf dem Gebiete der Landwirtschaft.  
Mitteilungen des Statistischen Bureaus des Kanton Zürich,  
Heft. 105.  
Mitteilungen des Statistischen Bureaus des Kanton Bern,  
1913/I.  
Bericht des Schweiz. Bundesrates über seine Geschäftsführung.  
(Containing Bericht des Veterinärarmtes über Schlachtungen.)  
Handwörterbuch der Schweiz. Volkswirtschaft, Fleischkonsum.  
Volkswirtschaftslexikon der Schweiz, vol. II, p. 311 ff.

## Meat Production

Statistics on the production of meat in Switzerland are not yet developed to a point where they can be considered satisfactory. There are, first, the reports of the Swiss Veterinary Office, as published yearly in the Bericht des Schweizerischen Bundesrates. \* This office collects statistics of the number of each class of livestock slaughtered under state inspection. The classification is as follows: bulls, oxen, cows, heifers (over 6 months), calves, sheep, goats, pigs and horses. Unfortunately, these statistics do not include all the slaughter on farms. But the distinction between domestic and imported cattle is very carefully made. With these figures, and taking an average slaughter weight as recorded by the slaughter houses of the six principal cities of the country, the office proceeds to compute the meat production. It adds to this figure the total amount of meat imported and the amount of meat from poultry and fish which come under the meat inspection service during the year. This total is then divided by the number of population for the given year, in order to obtain an average consumption per person. Not only is the farm slaughter of cattle omitted, but also the slaughter of poultry. Meat export, although not an important item, is also taken account of.

Only yearly figures are published. In order to have monthly figures on meat production, the Federal Labor Office, created during the World War, started to make its own statistics. It has secured the collaboration of about 42 public slaughter houses distributed all over the country, from which it receives monthly reports of slaughtering. The figures are published principally in Wirtschaftliche-und Sozialstatistische Mitteilungen. The classification is the same as that used by the Veterinary Office. The Labor Office claims that these records include about 40 per cent of the total slaughter, and that they indicate fairly well the movements of the total slaughter throughout the country.

A second method of estimating the meat production of the country, based on the census figures of livestock, is used by the Secretariat in Brougg, and is explained and described by Henry Nater in Forschungen auf dem Gebiete der Landwirtschaft, p. 295 ff. The procedure is rather involved, but is here presented in its essential details, because many countries are

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\* The tables are partly reproduced in "Statistisches Jahrbuch."



forced to estimate livestock production by equally devious means.

First, a 75 per cent calf crop per year is assumed. To illustrate, in April 1901, there were enumerated 739,922 cows; the calf crop during the preceding 12 months would therefore be -

554,942

On April 19, the day of the census, there were enumerated the following numbers of calves:

(a) Calves for breeding, less than 6 months	157,220
(b) Calves for slaughter, less than 6 months	42,895
(c) Heifers from 6 - 12 months	<u>87,092</u>
<u>Total</u>	<u>287,207</u>

It was estimated that half of the breeding cattle imported were included in these figures. The average imports of the years 1900-1901 were as follows:

(a) Young cattle without teeth - 2494	
1/2 of these	1247
(b) Calves for breeding weighing up to 60 kilograms	85
<u>Total</u>	<u>1332</u>

The number of cattle less than  
1 year old and of Swiss origin  
was therefore 287,207 - 1332 = 285,875

From the total calf crop has, there-  
fore, been eliminated 269,067

To this amount must be added the  
number of calves for slaughter 42,895

The total number of calves eliminated  
from Swiss agriculture was then 311,962

The census returned the number of cattle under 1 year of age as follows:

(a) Calves for breeding under 6 months	157,220
(b) Heifers from 6-12 months	87,092
	<hr/>
	<u>Total</u> 244,312

Of these, there were needed for replacements:

(a) Bulls from 1-2 years	13,886
(b) Oxen from 1-2 years	20,773
(c) Cows (2/9 of the total number of cows - average lifetime of a cow taken as 6 1/2 to 7 1/2 years)	164,427

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Total of 199,086  
replacements

As above, half of the imported cattle of these classes were considered to be included in this figure and were therefore deducted -

5338

Remaining displacement of Swiss origin 193,748

The surplus of young cattle therefore amounted to  
(244,312 - 193,748) = 50,564

Here were also eliminated:

(a) Bulls from 1-2 years (13,886-6,025)	7,861
(b) Bulls over 2 years	6,025
(c) Oxen from 1-2 years (20,773-19,454)	1,319



(d) Oxen from 2-3 years: (19,454-10,935)	8,519
(c) Oxen over 3 years of age	10,935
(f) Heifers: The census returns	
(aa) Heifers 1-2 years old	157,938
(bb) Heifers over 2 years of age	84,235
	Total 242,173

It was assumed that the first calves were born of heifers at the age of 2 years and 3 months. The number of heifers in calf yearly would then amount to

$$\frac{4}{5} \times 242,173 = 193,738$$

There were needed for replacement of the cows only (see above) 164,427

Of these there were imported (same method as above) 2,794

Of Swiss origin there would be 161,633

There remains therefore a surplus of heifers of -

$$193,738 - 161,633 \quad 32,105$$

(g) Cows (see above) 164,427

Total 593,717

Deduct a loss, estimated at 2 per cent 11,873

Total livestock production for slaughter or export 581,844

Export (total) 31,014

There was available for consumption in Switzerland 550,830

Having ascertained in this way the total number of head of each class of neat cattle taken out of Swiss agriculture, either through export or through consumption, it was very easy for the office to compute the figure for the total production of meat from each of these classes of animals. The export statistics revealed the number of head exported. (A slight difference between the classification of the export statistics and the classification as used in the livestock censuses had to be adjusted). In 1901, the average slaughter weight was taken from an enquête made from the Federal Office of Statistics in connection with the census on livestock. At present, undoubtedly, more recent returns are used.

Commenting upon the method, one must point out that it entirely neglects the increasing trend in the herds of livestock in Switzerland. This seems to have been recognized by the Secretariat, and has been provided for in a new study. [Die Genossenschaftliche Milchverwertung und Milchverarbeitung (Bauernsekretariat), p. 44]. Also it is most likely that the revised method has now been applied to the earlier years, as the figures worked out by Henry Näter in 1901 no longer coincide with the figures now published by the Secretariat for the years 1886, 1896 and 1901. (See Statistische Erhebungen). It appears also that the fundamental assumption of a 75 per cent calf crop has been increased to 80 per cent. At the same time, the estimated loss has been increased from 2 per cent to 3 per cent.

The Secretariat is also estimating by the same method the production of pork, mutton and meat from goats. For poultry, the average lifetime is taken as 3-4 years, and the slaughter estimated on the base of the census returns. The results of these estimates are published in Statistische Erhebungen. From a study made by Dr. S. Schneider in 1917 of the meat consumption in Switzerland, we are able to compare the two figures obtained by the Swiss Veterinary Office and by the Secretariat. The returns of the Veterinary Office, of course, had to be amended by an estimate of farm slaughter. This estimate was made on the following basis: It was assumed that from each 100 farms are slaughtered yearly 1 head of grown-up cattle (oxen, heifers, bulls, cows), 4 calves, 1 sheep, 1 goat, and on each farm 1 hog. The number of farms was taken from the farm census of 1905. The results are as follows:

(a) Returns of the Veterinary Office amended by estimates of farm slaughter	108,960,533 kilograms
(b) Computation by the Secretariat	120,495,496 kilograms

The difference is not very great. The method of the Secretariat can be applied only for the census years (every 5 years), while the other



method can be used for yearly estimates. No such yearly estimates, however, have been made.

It should be explained also, that "slaughter weight" according to the Swiss terminology means "dressed weight."

For computation of consumption figures, the offal (liver, heart, etc.) also has to be added. It amounts to from 10.56 kilograms to 32.31 kilograms for the different classes of livestock.

Only one canton, the Canton de Vaud, has collected statistics of livestock slaughtered regularly during more than 30 years. The questionnaires furnished by the cantonal government require the communal authorities to state the number and live weight of several classes of livestock slaughtered in the commune during the year. How accurate these figures are cannot be stated.

### Eggs and Dairy Products

No production figures of eggs are published in Statistische Erhebungen. In the section on consumption, however, can be found the number of eggs produced by Swiss agriculture. This number does not include the number of eggs used for hatching. In view of the fact that a large number of young chickens are imported, any figure as to eggs for hatching would not have much value. The Secretariat conducts special investigations into the financial returns from poultry farming, and it is most likely that the production estimates above mentioned are based on these returns, along with the returns from the censuses on poultry. As the first census of this kind was taken in 1918, the earlier figures cannot have a very reliable basis.

Statistics on dairy products are somewhat better, although only estimates. They are compiled by a special committee on statistics, appointed by the Association of Swiss Milk Producers. Since 1923, the reports have been published annually in the Landwirtschaftliches Jahrbuch. An earlier report, covering the period of 1911-1917, was published in the yearbook of 1918. The committee takes as a starting point the number of cows returned by the livestock censuses. For intermediate years this number is estimated. It then proceeds to estimate the yearly production per cow in kilograms. These two estimates multiplied together give the total amount of milk produced. The report for the year 1929 (Landwirtschaftliches Jahrbuch, 1930, p. 334 ff.) explains somewhat on what basis the estimate of the production of milk per cow is made. The committee admits that the figures assumed are rather conservative when compared with the records of milk production as reported in other parts of the Landwirtschaftliches Jahrbuch (breeding associations and agricultural experiment stations



reports). It draws attention, however, to the following facts:

1. Some inquiries of cheese factories and milk traders as to the quantity of milk received, and the number of cows kept by the farmers, have shown a much lower yield per cow (allowance was made for milk consumed on the farm and fed to livestock) than indicated by reports of the above associations.
2. The census on livestock makes no distinction between cows in milk and others. This has to be considered in computing the average yield of milk produced per cow.

In making its estimates, the committee takes also into account weather conditions during the year, quantities of imported feedstuffs, and possible influence of diseases (foot and mouth disease). The same method is followed in estimating the production of milk from goats. Included in the report of this committee is a table prepared by the Secretariat, giving milk production in each month of the year. This office receives monthly reports from 1000 to 1500 cheese factories and other milk collecting agencies as to the amount of milk delivered to them by the farmers (also price information at the same time - see below). From these figures, the Secretariat draws conclusions as to the current trend of milk production.

In the study *Die Genossenschaftliche Milchverwertung und Verarbeitung in der Schweiz*, the Secretariat tried to make an estimate of the total milk production according to an entirely different method. The basic figures were obtained by sending out questionnaires to the milk producers' associations. Of 3710 questionnaires sent out, 3571 came back to the office properly answered. The computation of the total production was made by combining these returns with other data as follows:

1. Estimate of the amount of milk consumed by the farm population, this estimate being based on records taken from the farm bookkeeping records.
2. Estimate of the milk consumed by the non-agricultural population, based on family budget studies (see section Y below), and an estimate of the amount of milk consumed by tourists, milk imports also being deducted.
3. A computation of the amount of milk used as feed for breeding purposes on the farms.



4. An estimate of the amount of milk used for manufacturing purposes, taken largely from the answers to the questionnaires.

The total production, computed in this way, amounted for 1922-23, to 24,320,699 quintals. The comparable figure as obtained by the Committee on Statistics was 24,138,000 quintals. (An average of 1922-23 is used here because these estimates are made for the calendar year, while the estimate of the Secretariat was made for the crop year (May to April)). Either method probably gives satisfactory results.

As regards butter and cheese, the Committee on Statistics makes yearly estimates. The Cheese Union, the central selling organization of the Swiss milk producers and the traders, furnishes some figures on cheese production, and also on butter production. These statistics, however, are not well developed as yet, and still include considerable guess work. The figures of the Committee on Statistics date back to 1916. But earlier estimates are available, the Secretariat furnishing them back to 1886 (Statistische Erhebungen). Other estimates can be found in Handwörterbuch der Schweiz. Volkswirtschaft, Artikel Molkereiwesen. The measure is uniformly the kilogram or the quintal (100 kilograms), except that for the retail trade the "liter" is used (1 liter = ca. 1.03 kg).

Mention should also be made of two early censuses on cheese production taken by the Department of the Interior in 1840-50 and again 1857. The results of these are quoted in the Handwörterbuch, Vol. III-1, p. 76.

The Bureau of Statistics of the Canton Bern attempted three times to collect reliable data on the production of milk and dairy products in its territory in 1883, 1894 and 1911. The results of these investigations are published in Mitteilungen 1885-I, 1895-II and 1913-I. The results for 1883 are also published in Statistisches Jahrbuch der Schweiz, No. 1, p. 46. The results of a still earlier census can be found published in Statistisches Jahrbuch für den Kanton Bern, No. 5 (1872). Unfortunately, the questionnaire used for the census in 1911 was set up in too complicated form, and the returns are therefore considered by the Bureau to be unreliable, especially in regard to the total production of milk. This figure, in fact, had to be estimated. Moreover, the production of cheese and butter on the "alps" was not recorded. The Bureau also considers the returns of the cheese factories on the plains as not being very accurate.

Several other cantons also have conducted inquiries into the production of milk and dairy products. Those of Zürich for the period 1883-1919 were restricted to the cheese factories and other milk-collecting



agencies. They therefore do not represent the total milk production. Figures are computed on cheese and butter manufactured. The returns available for other cantons, which are published in Statistisches Jahrbuch, are obtained in a similar way. In the period from 1900 to 1910, these inquiries were abandoned one after another.

#### Other Products

No statistics are available on the production of wax, silk and furs. Silver foxes have only recently been introduced into Switzerland. There are estimates on the production of honey, made by the Secretariat in Brougg. As in the case of eggs, the production data are obtained partly by the special investigations on the financial returns from bee keeping. As already pointed out above, censuses on the number of beehives have been taken since 1876 in connection with the livestock censuses. The bases, therefore, seem to be reliable.

The United States census has been endeavoring to obtain estimates of total production and sales of livestock and livestock products, but to some of the questions satisfactory answers have not been given and, accordingly, there have always been gaps in the data. The 1930 schedule omits no important items. Home consumption of livestock products has always caused trouble; likewise, farm slaughtering. The dairy production returns have been confused because of the different uses to which milk is put, and forms and methods of sale.

The 1930 census makes another attempt to collect statistics on all these points in such a way that the results will be reasonably complete and consistent, the schedule being organized in such a way that the totals will be as complete as possible, and sub-items will check against the totals. Two questions asked specifically were the numbers of cows being milked at the time the census was taken, and the daily production of milk. There is a similar question for the daily productions of eggs.

The statistics as to numbers of livestock by age and size classifications can be used as a check against the figures as to sales and purchases.

The Bureau of Crop and Livestock Estimates is confronted with the difficulty of reconciling its annual data on sales and production from livestock with the census figures. The shifting of the dates of the census has complicated this problem very greatly. At the present time, this service is collecting a large amount of supplementary data that enables it to reconcile its data with that of the census and establish continuing series for the inter-censal years. Semi-annual pig surveys,



made as of June 1 and December 1, through the rural carriers of the Post Office Department, were inaugurated in 1922. These surveys attempt to get information as to the current hog production, and intentions as to future production. The June 1 survey also carries questions as to breeding ewes and lambs saved, and from these reports ratios are obtained showing lambs saved from November 1 to June 1 as a percentage of breeding ewes 1 year old and over on January 1.

As a further basis for estimating livestock production by states, a large amount of information is now being obtained as to livestock movements from and into each state from two sources, one, the records of livestock markets, packing houses and similar sources, giving the number of head of each species received from each state, and the number of stocker and feeder animals shipped into each state; the other, the records of railroads giving the number of cars of different species of livestock forwarded from and received at each station in the state, which are assembled into county, district and state totals.

On the basis of this and other information, annual balance sheets for each species are prepared. These show, as debits, the number on hand the first of the year, the number born and the number brought into the state during the year, and as credits, the number shipped to market, the number slaughtered locally and on farms, and the number that died. The difference between the sum of the two sides is the new estimate of numbers on January 1.

The schedule recommended by the International Institute of Agriculture for the World Census provides for the collection of data on the production of milk, butter and cheese, eggs, wool, mohair, honey, silkworm eggs and cocoons. As pointed out in the above discussion of crop production, two methods are recommended by the Institute for obtaining these data. The first method is to ask each farm operator to state the total quantity of each livestock product obtained from the livestock reported. This method was used in the United States Census for 1930. The second method recommended was to ascertain "through special investigation conducted by experts ... the average rate of production per domestic animal, for each of the geographical units for which the census data are compiled," and multiply this average by the number of livestock in each class respectively obtained in the census. This method is similar to the one used by Switzerland.

No questions have been included in this census schedule as to the production of meat, the weight of animals slaughtered on farms, or the quantity of meat consumed by the farm family, that was furnished by the farm. These questions were considered by the Institute and omitted, because it did not consider the recommendation of a particular method for establishing statistics of meat production and consumption advisable for the world census of 1930, owing to the diversity of statistical organizations



in the different countries adherent to the International Institute of Agriculture. However, the Institute recommended the collection of data on number and weight of animals slaughtered on the farm and in slaughterhouses by means of questionnaires, special surveys and the analysis of federal reports on slaughtering, which could be used with the data on number and age of livestock to estimate the total production of meat in a country.

#### Q. Combined Agricultural Production

No official attempts have been made in Switzerland to combine the foregoing statistics on crop and livestock production into one figure for total value of agricultural production. Such a combination could be made from the statistics of physical volume and prices that have been described above, but it would be a very rough approximation, particularly because of the data on physical volume of livestock production.

In the United States, the Bureau of Agricultural Economics has prepared such an estimate for each crop since 1919 to 1920, and published it in the July number of 'Crops and Markets.' It takes the form of an estimate for the gross value of farm products, and a deduction for products fed, used for seed, and waste. The remainder is divided into cash income and value of food and fuel consumed on farms. These figures are likewise based on a good many estimates, but the major items are reasonably well substantiated. The largest estimate is in the matter of crops fed to livestock.

Neither has Switzerland made any attempt to construct an index series for the physical volume of agricultural production. Such a series could be devised, and would probably be somewhat more dependable than figures based on weight alone. Combined with an index for the prices of farm products, it would show changes in the total value of agricultural production.

The Bureau of Agricultural Economics series for value of agricultural production divided by its index of prices of farm products gives a rough index of the physical volume of agricultural production. It is necessary, however, to convert them both either to a crop or a calendar year basis before this can be done. For the period before 1920, Dr. O. E. Baker has a series running back to 1900, in which he has separated crops for food, animal products, and industrial crops. He has made use of the data of the Department of Agriculture in compiling this series, but it is not to be interpreted as official. In constructing his index series, Dr. Baker weights the relatives for the different products according to average prices from 1917 to 1926. The Harvard Economic Society has also compiled two indices of physical volume of agricultural products, one for crop products, and one for livestock products, dating from 1879. It makes no effort to combine these into one series on the value basis (See Review of Economic Statistics, September, 1920, for a discussion of the method of construction of the index series).



### R. Ratio of Agricultural Production to Agricultural Workers

Given data as to value of agricultural production, and these adjusted for differences in price level between countries, and as to persons gainfully employed in agriculture and as to population living on farms, it would be possible to compute for any country the value of agricultural production per capita of these groups, and the resulting figures could serve as a basis for comparing the efficiency with which agricultural labor is employed in these countries. Such data would be significant when used in combination with those on ratio of agricultural workers to land. The major obstacle to the foregoing is that satisfactory measures of differences in price levels between countries are extremely difficult to construct. Given index series of the changes in agricultural production per worker, it would be possible to compare the changes that are occurring in different countries, along with the growth of population changes in land utilization and the like. Data of these kinds can be derived from the index series above described, particularly for the period since 1919. They are of course only as dependable as the component items in them.

A somewhat different method of approach to the foregoing problem in terms of historical changes in the efficiency of agricultural labor is outlined for Wales by Professor A. W. Ashby and J. L. Llefelys Davis (Welsh Journal of Agriculture, Vol. 5, The Work Efficiency of Farm Organization in Wales, 1871 to 1921).

### S. Ratio of Agricultural Production to Land

The ratio of agricultural production to land, or output per acre, will serve as the best single measure of gross productivity of the land in different countries, and hence of the intensity of land use in terms of the other factors of production which are associated with land. Such a figure can be derived, if the data described above are made available. It will be desirable to relate such a figure to the various types of agricultural land. A separate figure can be derived for crop production and crop land.

### T. Forest Products

Sources listed in Part I are Beiträge zur Statistik der Schweizerischen Eidgenossenschaft, under Departement des Innern, which gives some data for 1842-43; and Statistiques et Évaluations Agricoles, under Union Suisse des Paysans.



The important other sources of information are as follows:

Schweizerische Forststatistik 1907 ff. Herausgegeben von der Eidgenössischen Inspektion für Forstwesen, Jagd und Fischerei.

Die Forstlichen Verhältnisse der Schweiz. Herausgegeben vom Schweiz. Forstverein. II. Auflage 1925.

No census figures are available as to the present production of wood and timber. The census of 1929 included the first questions relating to wood and timber production. These differ in several respects from the proposals contained in the World Census schedule, but seem to be more adapted to the special conditions in Switzerland. The period from which returns have to be made is from July 1, 1928 to June 30, 1929. The questions are as follows: Wood cut (a) for selling, (b) for own use, (c) for distribution between the members of the commune (applies to public forests only). This total is divided into fire-wood and timber; and timber is divided into (1) spruce (white and red), (2) other conifers, (3) beech, (4) oak, (5) chestnut, (6) other deciduous.

Estimates of wood and timber production are available from 1907 on. They have been made by the Federal Forest Service in cooperation with the Cantonal Forest Services. While the figures on wood and timber production in the publicly owned forests (about 72 per cent of the total forest area) can be taken as accurate, the production figures of the privately owned forests are based on estimates, and are not considered satisfactory. The office works out production figures per hectare of woodland, and then computes the total amount of wood and timber consumption in Switzerland by adding the balance of the imports and exports. The unit of measurement is the cubic meter. The Forststatistik, moreover, contains very detailed tables on the value of the wood and timber produced in the public forests. The gross value figures are also expressed per cubic meter of wood and per hectare of woodland. The expenses of cutting the wood and estimated income of the forest enterprises are also given.

Quotations from some of these tables, such as average yields for periods of years since 1907, can be found in the Statistisches Jahrbuch, the Statistische Erhebungen, etc., and in Volkswirtschaft, Arbeitsrecht, etc.

For figures on the yearly growth of wood measured in cubic meters per hectare, see Die Forstlichen Verhältnisse der Schweiz, pp. 177-189.

The Federal Forest Service also compiles tables showing the number of trees used in reforestation enterprises which are under the control of the Federal Government.



## U. Fisheries

Part I lists, as sources, Statistisches Jahrbuch der Schweiz, under Eidgenössisches Departement des Innern; and Statistiques et Évaluations Agricoles.

There are no census data available on the total quantity of fish caught in Switzerland, and no question was provided in the census of 1929 to obtain such figures. The Schweiz. Oberforstinspektorat, however, computes a yearly estimate, which is published in the Statistisches Jahrbuch and taken over into the Statistische Erhebungen etc. of the Secretariat in Brougg. The figures for 1921 and earlier years are considered much too low. The same Federal Office publishes yearly data in regard to the number of fish hatcheries, this series dating back to 1888.

## V. Food Production and Consumption in Relation to the Population

Source material is the same as listed in section Y, with the following additions: Those in Part I, Wirtschaftliche und Sozialstatistische Mitteilungen and Rapports Économiques de la Feuille Officielle Suisse du Commerce, under the Volkswirtschaftsdepartement; and Beiträge zur Statistik, etc. (1854-58), under the Departement des Innern; those not listed in Part I:

Schneider S. - Die Erzeugung und der Verbrauch von Nährwerten in der Schweiz. Zeitschrift für Schweizerische Statistik, 1917, p. 275, and 1919, p. 7.

Howald, O. - Die Ernährung der Schweizerischen Bevölkerung in den Jahren 1920-22. Zeitschrift für Schweizerische Statistik, 1924, p. 237.

Simler, R. Th. - Versuch einer Ernährungsbilanz der Schweizerischen Bevölkerung. Zeitschrift für Schweizerische Statistik, 1873, p. 158

The family budget studies described in section Y furnish figures on the physical quantities of goods consumed, especially of food products. In the report of the Farmers' Secretariat, the analysis is not carried very far. The tables worked up cover only milk, wine, cider, liquor, potatoes and meat. The consumption is given per "man unit." The analysis of the urban budgets goes much more into detail, but gives also quantities only of food consumed. But these quantities are worked out for each income group and family age group for the different cities, for each occupational group, etc. Unfortunately, the results are not exactly comparable with those worked out by the Sec-

retariat on account of the different scales used. Both publications give total figures on consumption per family. A very rough comparison, therefore, can be made by dividing the quantity consumed per family by the average number of persons in these families, obtaining thus an average consumption per person. Although this method is not satisfactory, the results give some indication of differences in consumption between farm and urban population.

In section V of Statistische Erhebungen und Schätzungen, etc., the Secretariat published several tables on food consumption in Switzerland. First, an estimate of the production is made, to which is added the net balance of imports and exports. In a third table the total is reduced to a per-capita basis. The production data have been discussed in sections N, P, and U above. The per-capita consumption data seem to have been computed very roughly, for a check of the figures reveals the fact that the population figures applied vary very much. The following table may illustrate the differences in the results obtained by using different methods.

Consumption per Capita

	Family budgets		Farm book accounts	Estimates of Secretariat
	1919	1922	1921	1920-21
Cheese kg.	4.3	4.0		10.9
Butter kg.	3.7	6.3		5.0
Milk ltr.	252	256	380	280
Meat kg.	19.6	26.2	44.6	49.5
Sugar kg.	15.6	19.5		21.3
Eggs, number	52	124		112
Potatoes, kg.	70.9	58.5	227	119
Wine ltr.	8.6		(19 per man unit)	49

Two recent attempts to ascertain the total food consumption on a unit basis and in calories must be mentioned. The method was developed by Dr. S. Schneider in 1917 and taken over by Dr. Howald, scientific collaborator of the Farmers' Secretariat in Brougg. Dr. Schneider made the investigation for the years 1908-12 and 1917, while Howald did the same for the period 1920-22 and revised Schneider's results for 1908-12 on the basis of more accurate production estimates for that period. The method adopted by these investigators is as follows: The estimates of the production of food products are taken from the Secretariat in Brougg. Deductions are made for seed and waste. Of the remaining quantity available for food, the content of protein and of fats and of carbohydrates is computed according to tables worked out by König, Chemie



der Nahrungs-und Genussmittel, vol. II. The same is done for imports and exports, and the balance added to the production figures. The conversion into calories was made according to the scale set up by Rubner:

1 gram carbohydrates	=	4.1 calories
1 gram fat	=	9.3 calories
1 gram protein	=	4.1 calories

The total population is reduced to a unit basis. Curiously enough, these units have been worked out on four different scales (Engels, Rubner, Atwater, Zuntz) and an average taken from these results. Dividing the total calories by the number of units of population, the consumption per unit was obtained.

Simler, in 1873, proceeded on a different basis. Owing to the lack of production data, he took estimated quantities of food consumed and deducted the net balance of imports and exports, thus arriving at production figures. The two investigations, therefore, are not comparable. Both Schneider and Howald have taken into account the very heavy tourist trade of the country, and estimated the number of tourist "units" per year at 19 millions for 1908-12, and 10 millions for 1920-22. Compared with the total number of "units," these figures amount to 1.7 per cent in the first and 0.8 percent in the second period. The proportion may have increased somewhat in recent years, but no reliable statistics with respect to this are available as yet.

In the following, an attempt has been made to work out a comparison for Switzerland and the United States of total and per capita production and consumption for cereals, meat, milk, eggs, honey and fish. Also a few figures will be included for cotton and tobacco. No attempt will be made to work out comparisons of textile consumption for the two countries. Apparently no data as to textiles of any kind are available for Switzerland, and the data for production of cotton and wool by mills in the United States probably do not take account of exports and imports of manufactured cotton and woolen goods.

Comparison is worked out principally for the years 1920-to 1922. This is the only period for which data on production for all the foregoing commodities have been published in Switzerland. Records are probably available for working up similar estimates for certain other years, but they are by no means complete and have other important limitations which have been pointed out above.

The following table brings out very clearly the markedly greater production of most agricultural products per capita in the United States

than in Switzerland. The production of cereals per capita, for example, is 30 times greater in the United States than in Switzerland. Meat production, per capita, however, was somewhat less than twice as large in the United States as in Switzerland during this period, and milk production was only 30 percent larger. The production of potatoes per capita is larger in Switzerland than in the United States. In addition to the production of commodities common to both countries, the United States produces a large supply of cotton and tobacco.

When these production data for the two countries are compared on the basis of agricultural land, Switzerland appears to have a much smaller proportion of cereals than the United States, but a more intensive production of livestock products. Nearly three times as much meat and four times as much milk are produced in Switzerland per acre of agricultural land as in the United States. The production of cereals, potatoes, and vegetables, however, does not indicate intensity of cultivation so much as proportion of land occupied by these crops. For crops and livestock combined, records indicate the difference in farm organization of the two countries.

The individual food commodities produced and consumed within a country may all be combined for purposes of international or historical comparison on either of two general bases - market value or nutritive content. The results obtained by these two methods may differ appreciably, since market prices do not always reflect very closely the nutritive content of foods. Beef, for example, usually retails in the United States at a higher average price per pound than pork, although it contains, on the average, a smaller quantity of digestible nutrients. Out of season fruits and vegetables as well as many other commodities also command a price in the market based largely upon factors other than nutritive content as determined by chemical analysis.

The choice of the method for combining individual products should depend upon the purpose for which the final result is to be used. International and historical comparisons of the value of food commodities produced and consumed within individual countries at market prices would tend to indicate roughly the relative amounts of land, labor and capital required to produce those commodities, if accurate adjustments could be made for differences in price level. Similar comparisons of the quantity of digestible nutrients produced or consumed in a country would show the differences in diet and nutrition of peoples in different countries, and the relation of population to food supply in physical terms. Both measures of food production and consumption should prove useful in studying the relation of food supply to population.



Table XXXII. - AVERAGE ANNUAL PRODUCTION OF IMPORTANT FOOD AND OTHER AGRICULTURAL PRODUCTS 1920-1922, AND PRODUCTION PER CAPITA OF TOTAL POPULATION IN 1920 AND PER ACRE OF AGRICULTURAL LAND IN 1924 IN THE UNITED STATES AND SWITZERLAND

Commodity	Total production	
	United States	Switzerland (6)
	1000 Pounds	
Cereals	275,463,064	497,359 (7)
Meat (Dressed weight)	18,003,000 (1)	368,492
Milk	97,273,000 (2)	2,715,186
Eggs	2,481,066	35,617 (8)
Potatoes	24,367,020	1,565,688
Other vegetables and fruit	55,622,276 (3)	1,743,614
Cotton	5,191,500	
Tobacco	1,299,585 (4)	82
Fish	1,156,000 (5)	6,281
Honey	55,224	3,196

- (1) Imports of meat not deducted. They are very small
- (2) U. S. Census 1919 - 1.5 lbs. per dozen.
- (3) Estimated production in 1924-25.
- (4) Bureau of Fisheries not including Alaska.
- (5) U. S. Census, 1919.
- (6) Data are from a study by Howald on production and consumption.
- (7) Statistical Yearbook, 1924. Wheat, Spelt, Rye, Barley and Corn.
- (8) Statistical Yearbook, 1924, p. 102.

Table XXXII. - AVERAGE ANNUAL PRODUCTION OF IMPORTANT FOOD AND OTHER AGRICULTURAL PRODUCTS 1920-22, AND PRODUCTION PER CAPITA OF TOTAL POPULATION IN 1920 AND PER ACRE OF AGRICULTURAL LAND IN 1924 IN THE UNITED STATES AND SWITZERLAND  
(Continued)

Commodity	: Per 1000 persons of :		: Per 1000 acres of :	
	: total population :		: agricultural land :	
	: United :	: Switzer- :	: United :	: Switzer- :
	: States :	: land :	: States :	: land :
	: Pounds :		: Pounds :	
Cereals	: 2606 :	: 128 :	: 345 :	: 88 :
Meat (Dressed weight)	: 170 :	: 95 :	: 23 :	: 65 :
Milk	: 920 :	: 700 :	: 121.7 :	: 478 :
Eggs	: 23 :	: 9 :	: 3 :	: 6 :
Potatoes	: 231 :	: 403 :	: 30 :	: 276 :
Other vegetables and fruit	: 526 :	: 449 :	:	: 307 :
Cotton	: 49 :	:	: 6 :	:
Tobacco	: 12 :	:	: 2 :	:
Fish	: 11 :	: 2 :	: 1.4 :	: 1.1 :
Honey	: 5 :	: 8 :	: 0.1 :	: 0.6 :



The use of prices as a basis of combining individual food commodities is, however, limited at present to historical comparisons within the same country, since adequate measures of international differences in price level are not available. The construction of the necessary indexes, though, should not prove to be an entirely hopeless task.

The use of digestible nutrients as a basis of combining food products is also limited by a lack of adequate data in many countries. In estimating the total digestible nutrients produced or consumed within a country, it is first necessary to estimate the quantities of food commodities produced, and the quantities that are wasted, fed to livestock, used for seed or for industrial purposes, and the amount of exports and imports. In addition to such estimates, it is also necessary to determine the average quantity of digestible nutrients contained in the food produced for human consumption and consumed by the people of a country. Many chemical analyses of food have been made in the United States and foreign countries to determine the average content of digestible nutrients. These analyses naturally show that the digestible nutrients in the same class, or kind, of foods vary from country to country and in different sections of the same country. Soil, climate, fertilizer applications and other cultural practices affect the nutritive content of crops. Meats and other animal products vary in digestible nutrients according to the kind and amount of feed fed, the amount of fat, and other factors. Manufactured products naturally vary widely in nutritive content. Consequently it is difficult to determine the quantity of digestible nutrients in a unit of each food product that is representative of an entire country.

The differences in nutrient content of foods that may easily occur are well illustrated by the estimates of digestible nutrients per unit of important foods used in estimating the quantities of these nutrients produced and consumed in the United States and Switzerland. These estimates are shown in Table XXVIII. Some of the differences are rather striking.

Beef, for example, is estimated to have an average of only 9.0 percent fat in Switzerland compared with 15.5 percent for the United States, while the protein content is nearly the same for both countries. The analyses for pork show even larger differences, the fat content being estimated at 23.8 percent for Switzerland compared with 54.8 percent for the United States. The protein content for pork, however, shows an opposite difference, being 14.8 for Switzerland and 8.3 percent for the United States. The analyses for mutton show about the same nutrient content per pound in both countries. These differences in nutrient content of meats produced in Switzerland and the United States are a reflection of the difference in acreage and price of cereals, as well as of other factors.

Table XXXIII. - ESTIMATED AVERAGE PERCENTAGE OF DIGESTIBLE PROTEIN, CARBOHYDRATES AND FAT AND NUMBER OF CALORIES PER POUND IN IMPORTANT FOOD USED IN THE UNITED STATES AND SWITZERLAND.\*

Commodity	Protein		Carbohydrates	
	United States	Switzerland	United States	Switzerland
	Percent		Percent	
Beef	15.2	15.3		
Veal	15.6	15.9		
Pork & lard	8.3	14.8		
Mutton	13.0	14.4		
Lamb	14.1			
Poultry	13.7	17.9		0.3
Eggs	13.1	10.9		0.6
Milk	3.6	3.5	4.9	4.6
Potatoes	1.8	1.6	14.7	20.0
Wheat (Nutrients in flour)	8.3	6.5	54.5	53.4

Commodity	Fat		Number of calories per pound	
	United States	Switzerland	United States	Switzerland (1)
	Percent			
Beef	15.5	9.0	935	664
Veal	6.3	6.5	555	570
Pork & lard	54.8	23.8	2465	1280
Mutton	23.1	19.0	1215	1070
Lamb	18.7		1055	
Poultry	12.3	13.4	775	904
Eggs	9.3	10.2	635	644
Milk	3.6	3.7	310	307
Potatoes	0.1	0.09	311	406
Wheat (Nutrients in flour)	0.7	0.6	1198	1139

\* United States - "The Chemical Composition of American Food Materials" by W. O. Atwater and A. P. Bryant. U.S.D.A. Bulletin No.28.  
 Switzerland - König - "Chemie der Nahrungs-und Genussmittel," vol. II (second edition).

(1) Switzerland - Estimated by multiplying the protein and carbohydrate percentages by the number of calories per pound.  
 Footnote continued.



The nutrient content of dairy products is apparently about the same for both countries. The nutritive content of poultry and eggs should also average about the same, although the protein content of eggs is somewhat higher in the United States than in Switzerland, while for poultry meat it is somewhat lower.

The protein content of potatoes, according to these analyses, is about 12 per cent higher in the United States than in Switzerland, and about 30 per cent higher for wheat nutrients in flour. One explanation of these differences is the larger amount of rainfall in Switzerland than in the United States. Of course, some of the difference for wheat may also be due to difference in milling practice.

It is impossible to say how representative these analyses are for each country. Differences are, of course, to be expected between the two countries. In most cases, however, the number of chemical analyses upon which the data are based for individual foods is small.

#### Quantity of Digestible Nutrients Produced and Consumed in the United States and Switzerland

Various estimates of the total quantity of digestible nutrients produced and consumed in the United States and Switzerland have been made by different investigators. In Switzerland, Dr. S. Schneider worked up such estimates for the period 1908 to 1912, and Dr. Oskar Howald worked up similar estimates for the period 1920 to 1922. The methods used in making both estimates were very nearly the same. Production of all important food products was first obtained, and then deductions made for seed, feed, waste and industrial uses, in estimating food production for human consumption. The limitations of the production estimates have been pointed out in other sections of this report. The possibility of error in estimates of deductions is even greater than for production. In making up estimates of food consumption, deductions were made from the above production estimates for exports and waste in general (kitchens and marketing), and additions made for imports.

The only estimates available of digestible nutrients in food produced and consumed annually in the United States were by Dr. Raymond Pearl during the War, for the period from 1911-12 to 1917-18. Since then, data

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hydrate content per pound in each food by 1860 and the fat content by 4220, the average number of calories per pound as given by Albert E. Leach in "Food Inspection and Analysis," p.49. These figures correspond to the number of calories as set up by Rubner, and used for the Swiss estimates (see p. 229 and 230).



on the production and disposition of food products in the United States have been greatly improved, and as the period covered by Pearl's study was an unusual one, it was considered advisable to make similar estimates for the crop year 1924-25.

Both estimates were made on the same general basis used by the Swiss investigators. They represent, for the United States, the quantity of digestible nutrients in foods purchased. The loss of food nutrients in kitchens is therefore included in the estimate of consumption. This loss is probably much larger in the United States than in Switzerland. Pearl estimated that the average loss in kitchens in the United States was probably 5 per cent of the protein content in foods purchased, 25 per cent of the fat and 20 per cent of the carbohydrates. No estimates are available of the loss of food nutrients in the kitchens of Switzerland, but it is probably much smaller than Pearl's estimates for the United States.

Estimates of the digestible nutrients in food purchased per unit of population in Switzerland may consequently be expected to be lower than similar estimates for the United States. Estimates of the quantity of digestible nutrients produced should, however, be comparable for the two countries.

Estimates of the average annual quantity of digestible nutrients produced and consumed in the United States and Switzerland during two different periods, one immediately preceding the War and the other shortly after the War, made on this basis, are shown in Tables XXXIV to XXXV<sup>11</sup>.

In the United States, production and consumption of foods in terms of digestible nutrients are very evenly balanced, both in the pre-war and post-war periods. But in Switzerland, the consumption of food, in terms of digestible nutrients, is about double the production. The consumption of carbohydrates is nearly three times that of production, but the consumption of fat is only a fourth larger and protein only a third larger than production. There is, however, a noticeable increase in the proportion of digestible nutrients in food produced to food consumed in Switzerland in 1920-22 as compared with 1908-12. Estimates for the United States for these two periods, on the other hand, show no appreciable change.

In both periods, the United States is a net importer of carbohydrates, which consist primarily of sugar, and a large exporter of fats, which consist largely of lard. In 1924-25, however, net exports of fats from the United States were much lower, and of protein much higher, than in 1911-12. In Switzerland, net imports of carbohydrates are especially large, the proportion of imports to total consumption being more than twice as great as for fat or protein in both periods.



Table XXXIV. - ESTIMATED NET PRODUCTION<sup>(1)</sup> AND HUMAN CONSUMPTION<sup>(2)</sup> OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES IN THE UNITED STATES, 1924-25 \*

Commodity group	Protein		Fat	
	Pro-duction	Con-sumption	Pro-duction	Con-sumption
	Short tons		Short tons	
Meat & meat products	1,161,769	1,133,960	3,502,502	2,880,571
Poultry, fish, eggs & honey	384,074	418,163	222,172	243,376
Milk & milk products	1,131,911	1,130,986	1,881,159	1,882,841
Total live-stock products	2,677,754	2,683,109	5,605,833	5,006,788
Cereals & potatoes	2,251,485	1,678,117	316,218	261,077
Fruits & vegetables	269,824	285,730	92,009	97,881
Misc. fruits & vegetables	2,980	60,269	12,174	137,994
Vegetable oils & oil substances	61,006	61,006	766,671	902,767
Total vegetable products	2,585,295	2,085,122	1,187,072	1,399,719
Grand total	5,263,049	4,768,231	6,792,905	6,406,507

\* Estimates made on the same general basis used by Pearl. A detailed statement of method of procedure will be supplied upon request.

- (1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted.
- (2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in carryover and exports plus reductions in carryover and imports.

Table XXXIV. - ESTIMATED NET PRODUCTION AND HUMAN CONSUMPTION OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES IN THE UNITED STATES, 1924-25 \*

(Continued)

Commodity group	Carbohydrates		Calories	
	Pro-duction	Con-sumption	Pro-duction	Con-sumption
	Short tons		Millions	
Meat & meat products	5,294	5,169	34,079,167	28,119,837
Poultry, fish, eggs & honey	22,421	10,882	3,405,021	3,635,961
Milk & milk products	1,715,016	1,687,956	26,467,551	26,377,359
Total live-stock products	1,742,731	1,704,007	63,951,739	58,133,157
Cereals & potatoes	15,673,583	11,775,716	67,970,875	50,870,727
Fruits & vegetables	1,809,260	1,886,186	8,918,191	9,328,519
Misc. fruits & vegetables	1,344,803	6,504,251	5,116,366	25,534,846
Vegetable oils & oil substances	45,283	45,283	6,736,674	7,885,368
Total vegetable products	18,872,929	20,211,436	88,742,106	93,619,460
Grand total	20,615,660	21,915,443	152,693,845	151,752,617

\* Estimates made on the same general basis used by Pearl. A detailed statement of method of procedure will be supplied upon request.

- (1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted;
- (2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in carryover and exports plus reductions in carryover and imports.



Table XXXV. - ESTIMATED NET PRODUCTION<sup>(1)</sup> AND HUMAN CONSUMPTION<sup>(2)</sup>  
OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES  
IN SWITZERLAND, 1920-22\*

Commodity group	Protein		Fat	
	Pro- duction	Con- sumption	Pro- duction	Con- sumption
	Short tons		Short tons	
Meat & meat products	28,698	31,987	27,817	41,034
Poultry, fish, eggs & honey	2,701	4,701	2,176	3,602
Milk & milk products	58,431	54,155	69,767	72,225
Total live-stock products	89,830	90,843	99,759	116,860
Cereals & potatoes	16,435	47,224	1,567	7,734
Fruits & vegetables	3,995	5,595	1,320	3,739
Misc. fruits & vegetables	31	2,518	661	10,225
Total vegetables	20,461	55,337	3,549	21,698
Grand total	110,291	146,180	103,308	138,558

\* Howald, O. - Die Ernährung der Schweizerischen Bevölkerung in den Jahren 1920-22."

(1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted.

(2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in carryover and exports plus reductions in carryover and imports. Apparently no carryovers have been taken account of.

(1) (2)  
 Table XXXV.- ESTIMATED NET PRODUCTION AND HUMAN CONSUMPTION  
 OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES  
 IN SWITZERLAND, 1920-22 \*

(Continued)

Commodity group	Carbohydrates		Calories	
	Pro- duction	Con- sumption	Pro- duction	Con- sumption
	Short tons		Millions	
Meats & meat products	:	:	341,427	465,172
Poultry, fish, eggs & honey	1,380	1,855	33,712	54,957
Milk & milk products	60,895	57,832	1,032,452	1,025,890
Total live-stock products	62,275	59,687	1,407,591	1,546,019
Cereals & potatoes	160,507	410,408	671,359	1,755,129
Fruits & vegetables	51,013	57,183	215,741	246,912
Misc. fruits & vegetables	5,405	99,379	25,800	465,272
Total vegetables	216,925	566,970	912,900	2,467,313
Grand total	279,200	626,658	2,320,491	4,013,332

\* Howald, O. - "Die Ernährung der Schweizerischen Bevölkerung in den Jahren 1920-22."

- (1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted.
- (2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in carryover and exports plus reductions in carryover and imports. Apparently no carryovers have been taken account of.



(1) (2)  
 Table XXXVI. - ESTIMATED NET PRODUCTION AND HUMAN CONSUMPTION  
 OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES  
 IN THE UNITED STATES, 1911-12\*

Commodity group	Protein		Fat	
	Pro-duction	Con-sumption	Pro-duction	Con-sumption
	Short tons		Short tons	
Meats & meat products	1,110,826	1,077,979	3,398,575	2,795,783
Poultry, eggs, fish & honey	350,133	354,912	203,165	203,590
Milk & milk products	795,287	799,264	1,502,207	1,505,895
Total livestock products	2,256,246	2,232,155	5,103,947	4,505,268
Cereals & potatoes	1,663,329	1,493,597	247,403	224,938
Fruits & vegetables	172,414	131,629	23,545	37,487
Misc. fruits & vegetables	38,672	54,149	66,308	106,727
Vegetable oils & oil products	-	748	631,296	562,585
Total vegetables	1,804,415	1,680,123	1,018,552	931,737
Grand total	4,060,661	3,912,278	6,122,499	5,437,005

\* Source - 'The Nation's Food' by Dr. Raymond Pearl, p.76 & 212.

- (1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted.
- (2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in carryover and exports plus reductions in carryover and imports.

(1)

(2)

Table XXXVI. - ESTIMATED NET PRODUCTION AND HUMAN CONSUMPTION OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES IN THE UNITED STATES, 1911-12\* (Continued)

Commodity group	Carbohydrates		Calories	
	Pro-duction	Con-sumption	Pro-duction	Con-sumption
	Short tons		Millions	
Meats & meat products	5,401	5,380	32,927,724	27,705,272
Poultry, fish, eggs & honey	101,288	22	3,417,259	3,061,117
Milk & milk products	972,017	968,578	19,303,970	19,337,072
Total livestock products	1,078,706	973,980	55,648,953	50,103,461
Cereals & potatoes	11,863,421	10,611,111	52,524,065	47,030,036
Fruits & vegetables	1,842,787	1,176,348	3,722,622	5,196,104
Misc. fruits & vegetables	1,616,150	4,348,568	6,730,107	17,314,182
Vegetable oils & oil products	-	-	5,762,768	4,761,475
Total vegetables	14,322,358	16,136,027	68,739,562	74,301,797
Grand total	15,401,064	17,110,007	124,388,515	124,405,258

\* Source - 'The Nation's Food' by Dr. Raymond Pearl, p. 76 & 212.

- (1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted.
- (2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in carryover and exports plus reductions in carryover and imports.



Table XXXVII. - ESTIMATED NET PRODUCTION<sup>(1)</sup> AND HUMAN CONSUMPTION<sup>(2)</sup>  
OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES IN  
SWITZERLAND, 1908-1911 \*

Commodity group	Protein		Fat	
	Pro-duction	Con-sumption	Pro-duction	Con-sumption
	Short tons		Short tons	
Meats & meat products	25,261.36	33,158	25,075.94	35,917
Poultry, fish, eggs & honey	1,773.94	4,896	1,278.34	3,548
Milk & milk products	62,018.35	49,578	76,688.85	68,641
Total livestock products	89,053.65	87,632	103,043.13	108,106
Cereals & potatoes	12,328.67	55,711	1,182.88	5,774
Fruits & vegetables	3,468.97	5,050	1,219.91	2,785
Misc. vegetables & fruits		2,305		11,818
Total vegetables	15,797.64	63,065	2,402.79	20,377
Grand total	104,851.29	150,697	105,445.92	128,483

\* Howald, O. - "Die Ernährung der Schweizerischen Bevölkerung in den Jahren 1920-22.

(1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted.

(2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in exports plus reductions in carryover and imports. (Carryovers are of no importance in an importing country. They should be considered with respect to production and exports of cheese in the case of Switzerland, but this has not been done in the studies.)

Table XXXVII. - ESTIMATED NET PRODUCTION<sup>(1)</sup> AND HUMAN CONSUMPTION<sup>(2)</sup>  
OF DIGESTIBLE PROTEIN, CARBOHYDRATES, FAT AND CALORIES IN  
SWITZERLAND, 1908-1911 \*  
(Continued)

Commodity group	Carbohydrates		Calories	
	Pro-	Con-	Pro-	Con-
	duction	sumption	duction	sumption
	Short tons		Millions	
Meats & meat products	:	:	:	:
	:	8	305,521	425,403
Poultry, fish, eggs & honey	1,881.29	2,310	24,380	56,747
Milk & milk products	64,019.58	59,622	992,729	862,258
Total livestock products	65,900.87	61,939	1,322,630	1,344,408
Cereals & potatoes	129,909.36	467,110	539,035	1,993,354
Fruits & vegetables	44,629.99	49,818	189,194	228,308
Misc. vegetables & fruits	3,573.07	96,828	13,290	468,434
Total vegetables	178,112.42	613,756	741,519	2,690,096
Grand total	244,013.29	675,696	2,064,149	4,034,504

\* Howald, O. - "Die Ernährung der Schweizerischen Bevölkerung in den Jahren 1920-22."

(1) Net production equals total production of each food product less amounts used for feed, seed, and industry or wasted.

(2) Consumption equals production less amounts used for feed, seed, and industry or wasted, increases in exports plus reductions in carryover and imports. (Carryovers are of no importance in an importing country. They should be considered with respect to production and exports of cheese in the case of Switzerland, but this has not been done in the studies.)



There is a striking difference in the relation of production to consumption in the United States and Switzerland, as shown by the following summary of these estimates for the post-war period.

	Protein	Fat	Carbohydrates	Calories
	Short tons	Short tons	Short tons	Millions
United States 1924-25				
Production	5,263,049	6,792,905	20,615,660	152,693,845
Consumption	4,768,231	6,406,507	21,915,443	151,752,617
Excess production	494,818	386,398	- 1,299,783	939,228
Net exports (+) or im- ports (-) as percent of con- sumption	10.38	6.03	- 5.93	0.62
Switzerland 1920-22				
Production	110,291	103,308	279,200	2,320,491
Consumption	146,180	138,358	626,658	4,013,332
Excess production	- 35,891	- 35,250	- 347,458	- 1,692,841
Net exports (+) or im- ports (-) as percent of con- sumption	- 24.55	- 25.44	- 55.45	- 42.18

Similar summaries of estimates for the pre-war period are as follows:

	Protein	Fat	Carbohydrates	Calories
	Short tons	Short tons	Short tons	Millions
United States 1911-12				
Production	4,060,661	6,122,499	15,401,064	124,388,515
Consumption	3,912,278	5,437,005	17,110,007	124,405,258
Excess production	148,383	685,494	- 1,708,943	- 16,743
Net exports (+) or im- ports (-) as percent of con- sumption	3.79	12.61	- 9.99	0.01
Switzerland 1908- 12				
Production	104,851	105,446	244,013	2,064,149
Consumption	150,697	128,483	675,696	4,034,504
Excess production	- 45,846	- 23,037	- 431,683	- 1,970,355
Net exports (+) or im- ports (-) as percent of con- sumption	- 30.42	- 17.93	- 63.89	- 48.84



The proportion of total digestible nutrients consumed, that were obtained from each of the important groups of food products, were practically the same in both countries in both periods. The proportions of such nutrients in each important group of food produced for human consumption, however, varies widely in the two countries. These relationships are shown best in Tables XXXVIII and XXXIX. The relative importance of animal products as a source of food nutrients is much greater in Switzerland than in the United States, nearly 61 per cent of the estimated number of calories coming from animals and animal products compared with only 43 per cent for the United States. The difference in source of protein is largest for the two countries - Switzerland showing 81 per cent of its production of protein for human consumption in form of animal products compared with only 51 per cent in the United States. This predominance of animal products in Switzerland is largely due to the development of the dairy industry. Likewise in the United States, the low percentage of food nutrients obtained from animals is due mainly to the large production of cereals, much of which is exported. These relationships were practically the same during the pre-war period.

Such differences largely disappear when the source of nutrients consumed is considered. The uniformity in proportion to food nutrients obtained from animal and vegetable sources is, in fact, very striking and, indeed, somewhat surprising, in view of the probable difference in price structure for agricultural commodities in the two countries. The estimates show that 39 per cent of the estimated calories in food consumed in Switzerland comes from animal products compared with 40 per cent for the United States. It is interesting to note, however, in this table, that the proportion of calories in food consumed obtained from fats is slightly lower in Switzerland than in the United States, while the proportion of calories from carbohydrates and protein is somewhat higher.

In making estimates and historical comparisons of the relation between population and the production and consumption of digestible nutrients, it is first advisable to take account of differences in the age and sex of the population in the different countries, or in the same country at different times. In 1920, for example, a somewhat larger proportion of the population in the United States was under nine years of age than in Switzerland, as shown in Table XL. The proportion of females to males is somewhat greater in Switzerland than in the United States. Of course, age and sex are not the only characteristics affecting food requirements in which a population may differ. The food requirement, or consumption, of a nation may also be affected by difference in average weight of individuals, income, occupation, climate and many other factors.

Table XXXVIII. - SOURCE OF FOOD NUTRIENTS PRODUCED IN PERCENTAGES  
OF TOTAL PRODUCTION IN  
THE UNITED STATES, 1924-25, AND SWITZERLAND 1920-22.

Commodity group	Protein		Fat	
	United States	Switzerland	United States	Switzerland
Meats & meat products	22.07	26.02	51.56	26.93
Poultry, fish, eggs & honey	7.30	2.45	3.27	2.11
Milk & milk products	21.51	52.98	27.69	67.52
Total livestock products	50.88	81.45	82.52	96.56
Vegetable oils & oil substances	1.16		11.29	
Cereals & potatoes	42.78	14.90	4.66	1.52
Fruits & vegetables	5.13	3.62	1.35	1.28
Misc. fruits & vegetables	1.05	.03	.18	.64
Total vegetables	49.12	18.55	17.48	3.44
Grand total	100.00	100.00	100.00	100.00
Percentage of total calories from	12.75	17.75	37.33	37.73



Table XXXVIII. SOURCE OF FOOD NUTRIENTS PRODUCED IN PERCENTAGES OF TOTAL PRODUCTION IN THE UNITED STATES, 1924-25, AND SWITZERLAND 1920-22

Commodity group	Carbohydrates		Calories	
	United States	Switzer-land	United States	Switzer-land
Meats & meat products	10.02		22.32	14.72
Poultry, fish, eggs & honey	1.11	1.49	2.23	1.45
Milk & milk products	8.32	21.81	17.33	44.49
Total livestock products	8.45	22.30	41.88	60.66
Vegetable oil & oil substances	.22		4.41	
Cereals & potatoes	76.03	57.49	44.52	28.93
Fruits & vegetables	8.78	18.27	5.84	9.30
Misc. Fruits & vegetables	6.52	1.94	3.35	1.11
Total vegetables	91.55	77.70	58.12	39.34
Grand total	100.00	100.00	100.00	100.00
Percentage of total calories from	49.92	44.52		

Table XXXIX. - SOURCE OF FOOD NUTRIENTS CONSUMED IN PERCENTAGES OF TOTAL CONSUMPTION IN THE UNITED STATES, 1924-25, AND SWITZERLAND, 1920-22

Commodity group	Protein		Fat	
	United States	Switzer-land	United States	Switzer-land
Meat & meat products	23.78	21.88	44.96	29.61
Poultry, fish, eggs & honey	8.77	3.21	3.80	2.60
Milk & milk products	23.72	37.05	29.39	52.13
Total livestock products	56.27	62.14	78.15	84.34
Vegetable oil & oil substances	1.28		14.09	
Cereals & potatoes	35.19	32.31	4.08	5.58
Fruits & vegetables	5.99	3.83	1.53	2.70
Misc. Fruits & vegetables	1.27	1.72	2.15	7.38
Total vegetables	43.73	37.86	21.85	15.66
Grand total	100.00	100.00	100.00	100.00
Percentage of total calories from	11.62	13.44	35.36	28.91



Table XXXIX. - SOURCE OF FOOD NUTRIENTS CONSUMED IN PERCENTAGES OF  
 TOTAL CONSUMPTION IN THE UNITED STATES, 1924-25,  
 AND SWITZERLAND, 1920-22  
 (Continued)

Commodity group	Carbohydrates		Calories	
	United States	Switzer- land	United States	Switzer- land
Meat & meat products	.02		18.53	11.59
Poultry, fish, eggs & honey	0.05	.30	2.40	1.37
Milk & milk products	7.70	9.22	17.38	25.56
Total livestock products	7.77	9.52	38.31	58.52
Vegetable oils & oil substances	.21		5.19	
Cereals & potatoes	53.73	65.49	33.52	43.74
Fruits & vegetables	8.61	9.13	6.15	6.15
Misc. Fruits & vegetables	29.68	15.86	16.83	11.59
Total vegetables	72.23	90.48	61.69	61.48
Grand total	100.00	100.00	100.00	100.00
Percentage of total calories from	53.01	57.64		

Table XL. - COMPARISON OF THE PERCENTAGE DISTRIBUTION OF  
 MALES AND FEMALES IN THE UNITED STATES AND SWITZER-  
 LAND BY AGE GROUPS, 1920\*

Age group	Males		Females	
	United States	Switzer- land	United States	Switzer- land
0 - 4	5.541	4.288	5.407	4.188
5 - 9	5.442	4.724	5.340	4.659
10 - 14	5.079	5.044	4.987	5.016
15 - 19	4.421	4.913	4.500	5.058
20 - 24	4.282	4.253	4.493	4.732
25 - 29	4.293	3.675	4.303	4.180
30 - 34	3.908	3.375	3.728	3.758
35 - 39	3.854	3.335	3.501	3.547
40 - 44	3.108	3.239	2.895	3.440
45 - 49	2.949	2.880	2.503	3.032
50 - 54	2.399	2.397	2.081	2.616
55 - 59	1.779	2.036	1.579	2.320
60 - 64	1.496	1.559	1.325	1.887
65 - 69	1.021	1.067	.935	1.348
70 - 74	.668	.732	.652	.993
75 - 79	.397	.448	.413	.622
80 - 84	.176	.190	.205	.281
85 - 89	.066	.055	.083	.085
90 - 94	.015	.009	.022	.016
95 - 100	.004	.001	.005	.002
100 and over	.001		.003	
Age unknown	.088		.053	
Total	50.987	49.013	48.220	51.780

\* Federal Censuses of Population.



Close approximations, however, have not been worked out as to the relation between most of these factors and food requirements. The relationship between food requirements, or consumption, and age and sex has been carefully studied by a number of investigators, who have set up standard or normal food requirements of persons of each age and sex. The most common standards in general use, expressed in percentage of adult male requirements, are shown in Table XLI. There are marked differences in these scales of food requirements. When the population of the United States and Switzerland is reduced to equivalent number of adult male units by using each of these scales, there are also marked differences in the results obtained, as shown in the following Table XLII.

The numbers of adult male units computed by the Engel, or Atwater or Bureau scale of food requirements are about six to seven per cent below the number estimated from the other three scales. These results suggest that, in making comparisons of actual food consumption or disappearance per adult unit of a nation's population, with theoretical requirements as determined by nutritive studies, it is necessary to consider carefully the scale used in estimating the number of adult male units. It is rather surprising, therefore, in view of the difference in age and sex of populations in the United States and Switzerland, to discover that the adult male units computed from all of these scales show practically the same international relationships. When the estimated number of adult male units from each scale are represented as a percentage of the number estimated from the United States scale in each country, the percentages are practically the same for both countries. For purposes of international comparisons, at least between the United States and Switzerland, the choice of a scale for estimating the equivalent number of adult units in each country would, therefore, seem to be of little consequence.

But comparisons of production and consumption per capita between the United States and Switzerland would reduce the figures per adult male unit for the United States about three per cent as compared with Switzerland. The United States population in 1920 was 121.44 per cent of the number of adult male units in that year, computed by using the United States scale of food requirements, compared with 118.32 per cent for Switzerland, computed on the same basis.

It should also be noted that these estimates do not include tourists in Switzerland. In 1920 the Swiss Association of Hotel Keepers estimated a total of 10,000,000 tourist days or the equivalent of about 27,000 tourists remaining an entire year, which is approximately 0.8 per cent of the total adult male units in Switzerland.

Another basis that has been recently developed for expressing the demand for food, clothing and other goods and services of persons of

Table XLI. - ADULT UNIT SCALES BASED ON FOOD REQUIREMENTS ONLY\*

		Per Cent of Adult Male Requirements									
		Name of scale used									
Age		Engel's quotient system		Atwater		Lusk		Amsterdam		United States	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 1 year		29	29	30	30	50	50	15	15	15	15
1 and under 2		31	31	30	30	50	50	20	20	15	15
2 "	"	34	34	40	40	50	50	30	30	15	15
3 "	"	37	37	40	40	50	50	35	35	15	15
4 "	"	40	40	40	40	50	50	40	40	40	40
5 "	"	43	43	40	40	50	50	45	45	40	40
6 "	"	46	46	50	50	70	70	50	50	40	40
7 "	"	49	49	50	50	70	70	55	55	75	75
8 "	"	51	51	50	50	70	70	60	60	75	75
9 "	"	54	54	50	50	70	70	65	65	75	75
10 "	"	57	57	60	60	83	83	70	70	75	75
11 "	"	60	60	60	60	83	83	75	75	90	90
12 "	"	63	63	70	70	83	83	80	80	90	90
13 "	"	66	66	80	70	83	83	85	85	90	90
14 "	"	69	69	80	70	100	83	90	90	90	90
15 "	"	71	71	90	80	100	83	100	90	100	90
16 "	"	74	74	90	80	100	83	100	90	100	90
17 "	"	77	77	100	80	100	83	100	90	100	90
18 "	"	80	80	100	80	100	83	100	90	100	90
19 "	"	83	83	100	80	100	83	100	90	100	90
20 "	"	86	86	100	80	100	83	100	90	100	90
21 "	"	89	86	100	80	100	83	100	90	100	90
22 "	"	91	86	100	80	100	83	100	90	100	90
23 "	"	94	86	100	80	100	83	100	90	100	90
24 "	"	97	86	100	80	100	83	100	90	100	90
25 "	over	100	86	100	80	100	83	100	90	100	90

\* Methods of Conducting Family Budget Inquiries by International Labor Office, Geneva. Studies and reports, series N, No. 9, p. 48.



Table XLIII. - RESULTS OF APPLICATION OF DIFFERENT SCALES TO UNITED STATES AND SWITZERLAND IN 1920

Name of scale used	United States	Percent of U. S. scale	Switzerland	Percent of U. S. scale
Equivalent number of adult male units				
Engel	81,462,395	93.6	3,050,685	93.0
Atwater	81,620,827	93.8	3,050,189	93.0
United States	87,045,240	100.0	3,279,276	100.0
Lusk	88,421,504	101.6	3,283,645	100.1
Amsterdam	86,570,369	99.4	3,254,841	99.3
Pearl	88,539,328	101.7	3,285,777	100.2

different ages and sex in terms of equivalent adult male requirement, is called the Ammain. The Ammain is defined as a gross demand for articles of consumption having a total money value equal to that demanded by the average male in that class at the age when his total requirements for expense of maintenance reach a maximum. The relative requirements of persons of each age and sex were worked out by Wilford I. King and Edgar Sydenstricker in a study of the complete budget of 140 families, and from the food records of 1500 families collected in 1907 from residents of twenty cotton mill villages of South Carolina. The results of this study cannot, however, be considered as representative of the United States or Switzerland. For instance, the proportion of women working in the cotton mills may be considerably higher than the proportion working outside of the home in other parts of the United States. If this is true, it would surely affect the relative proportion of expenditures of women as compared with men for food, clothing and other goods and services. Other conditions that would affect the relative expenditures of persons of different age and sex are also likely to be considerably different in these cotton mill villages than in the United States as a whole.

Furthermore, conversion units worked out on the basis of total expenditures for all goods and services are not so good for purposes of international comparisons of food consumption as standards worked out on the basis of food nutrient requirements alone. Even for international comparisons of the consumption of textile goods, it is not likely that the Ammain would be any better than digestible nutrients as a basis for converting the population of each country into comparable units.

4 The above estimates of the production and consumption of digestible nutrients in the United States and Switzerland divided by the estimated number of equivalent adult male units, estimated to be used according to the United States scale, for each period and country, are shown in Tables XLIII to XLVI.

There is a striking difference between the relation of population to "the production of digestible nutrients for human consumption in these two countries." Pearl's estimates and those of the Bureau of Home Economics show that the United States produces more than twice as many calories per adult male unit as Switzerland. The difference is especially great in the production of fat and carbohydrates. These relationships appear to be practically the same in pre-war and post-war years. When the production estimates are expressed on a per capita basis, the Swiss figures are increased slightly with relation to the United States as compared with the results obtained when expressed on a per adult male unit basis.



Table XLIII. - AVERAGE NET PRODUCTION FOR HUMAN CONSUMPTION OF DIGESTIBLE FOOD NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES 1924-25 AND SWITZERLAND 1920-22 \*

Commodity group	Protein		Fat	
	United States	Switzerland	United States	Switzerland
	Pounds		Pounds	
Meats & meat products	24.633	17.503	74.263	16.965
Poultry, fish, eggs & honey	8.143	1.647	4.711	1.327
Milk & milk products	25.213	35.636	41.210	42.550
Total livestock products	57.989	54.786	120.184	60.842
Vegetable oils & oil products	1.293		16.256	
Cereals & potatoes	47.738	10.023	6.705	.956
Fruits & vegetables	5.722	2.436	1.950	.805
Misc. vegetables & fruits	.063	.019	.258	.403
Total vegetables	54.816	12.479	25.169	2.164
Grand total	112.805	67.265	145.353	63.006
Per capita	91.888	56.661	118.598	53.073

\* See Table XXXIII for production data and explanations. The equivalent number of adult male units have been estimated by applying the United States scale of food requirements, Table XLI, to the number of persons in each age group, as reported by the 1920 census of population. This estimate for the United States was also increased by the percentage increase in total population from January 1920 to January 1, 1925. Since the census population in Switzerland is taken on December 1, no adjustment was made for this country.

Table XLIII. - AVERAGE NET PRODUCTION FOR HUMAN CONSUMPTION OF DIGESTIBLE FOOD NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES 1924-25 AND SWITZERLAND 1920-22 \*  
(Continued)

Commodity group	Carbohydrates		Calories	
	United States	Switzerland	United States	Switzerland
	Pounds		Number	
Meats & meat products	.112		361,290.1	104,116.6
Poultry, fish, eggs & honey	.475	.842	36,098.3	10,280.3
Milk & milk products	38.201	37.139	291,855.6	314,841.4
Total livestock products	38.788	37.981	689,244.0	429,238.3
Vegetable oils & oil products	.960		71,418.8	
Cereals & potatoes	332.327	97.892	720,592.9	204,727.8
Fruits & vegetables	38.362	31.112	94,546.2	65,789.2
Misc. vegetables & fruits	28.514	3.296	54,241.1	7,867.6
Total vegetables	400.163	132.300	940,799.0	278,384.6
Grand total	438.951	170.281	1,630,043.0	707,622.9
Per capita	359.932	142.436	1,332,954.0	596,064.0

\* See Table XXXIII for production data and explanations. The equivalent number of adult male units have been estimated by applying the United States scale of food requirements, Table XLI, to the number of persons in each age group, as reported by the 1920 census of population. This estimate for the United States was also increased by the percentage increase in total population from January 1920 to January 1, 1925. Since the census of population in Switzerland is taken on December 1, no adjustment was made for this country.



Table XLIV. - AVERAGE HUMAN CONSUMPTION OF DIGESTIBLE FOOD NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES 1920-25 AND SWITZERLAND 1920-22 \*

Commodity group	Protein		Fat	
	United States	Switzerland	United States	Switzerland
	Pounds		Pounds	
Meats & meat products	24.043	19.508	61.077	25.026
Poultry, fish, eggs & honey	8.866	2.867	5.160	2.199
Milk & milk products	23.930	33.029	39.922	44.049
Total livestock products	56.889	55.404	106.159	71.273
Cereals & potatoes	35.581	28.801	5.536	4.717
Fruits & vegetables	6.058	3.412	2.075	2.280
Misc. Fruits & vegetables	1.278	1.536	2.926	6.236
Vegetable oils & oil products	1.294		19.141	
Total vegetables	44.211	33.749	29.678	13.233
Grand total	101.100	89.153	135.837	84.505
Per capita	83.249	75.098	111.852	71.182

\* See Table XXXV for consumption data and explanations and the footnote to Table XLIII for method of estimating the number of adult male units.

Table XLIV. - AVERAGE HUMAN CONSUMPTION OF DIGESTIBLE FOOD NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES 1920-25 AND SWITZERLAND 1920-22 \*  
(Continued)

Commodity group	Carbohydrates		Calories	
	United States	Switzer-land	United States	Switzer-land
	Pounds		Number	
Meat & meat products	.109		298,112.3	141,852.0
Poultry, fish, eggs & honey	.231	1.131	38,546.6	16,758.9
Milk & milk products	35.790	35.271	279,639.5	312,840.4
Total livestock products	36.130	36.402	616,298.4	471,451.3
Cereals & potatoes	249.680	250.304	539,305.7	535,218.4
Fruits & vegetables	39.993	34.875	98,896.3	75,294.7
Misc. fruits & vegetables	137.909	60.610	270,707.6	141,882.5
Vegetable oils & oil products	.960		83,596.7	
Total vegetables	428.542	345.789	992,506.3	752,395.6
Grand total	464.672	382.192	1,608,804.7	1,223,846.9
Per capita	382.625	321.938	1,324,737.0	1,030,903.1

\* See Table XXXV for consumption data and explanations and the footnote to Table XLIII for method of estimating the number of adult male units.



Table XLV. - AVERAGE NET PRODUCTION FOR HUMAN CONSUMPTION OF DIGESTIBLE FOOD NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES 1911-12 AND SWITZERLAND 1908-12 \*

Commodity group	Protein		Fat	
	United States	Switzerland	United States	Switzerland
	Pounds		Pounds	
Meats & meat products	29.031	16.326	88.819	16.206
Poultry, fish, eggs and honey	9.150	1.146	5.309	.826
Milk & milk products	20.784	40.081	39.259	49.562
Total livestock production	58.965	57.553	133.388	66.594
Cereals & potatoes	43.470	7.968	6.466	.765
Fruits & vegetables	2.676	2.242	.615	.788
Misc. fruits & vegetables	1.011		1.733	
Vegetable oils & oil products			17.805	
Total vegetables	47.157	10.210	26.619	1.553
Grand total	106.122	67.763	160.007	68.147

\* See Table XXXV for data and explanations and the footnote to Table XLIII for method of estimating the number of adult male units.

Table XLV. - AVERAGE NET PRODUCTION FOR HUMAN CONSUMPTION OF DIGESTIBLE FOOD NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES 1911-12 AND SWITZERLAND 1908-12 \*  
(Continued)

Commodity group	Carbohydrates		Calories	
	United States	Switzerland	United States	Switzerland
	Pounds		Number	
Meats & meat products	.141		430,272	98,725
Poultry, fish, eggs & honey	2.647	1.216	44,654	7,878
Milk & milk products	25.403	41.374	252,248	320,788
Total livestock production	28.191	42,590	727,174	427,391
Cereals & potatoes	310.042	83.957	686,340	174,183
Fruits & vegetables	22.026	28.843	48,644	61,136
Misc. fruits & vegetables	42.237	2.309	87,943	4,294
Vegetable oils & oil products			75,303	
Total vegetables	374.305	115.109	898,230	239,613
Grand total	402.496	157.699	1,625,404	667,004

\* See Table XXXV for data and explanations and the footnote to Table XLIII for method of estimating the number of adult male units.



Table XLVI. - AVERAGE HUMAN CONSUMPTION OF DIGESTIBLE FOOD NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES 1911-12 AND SWITZERLAND 1908-12 \*

Commodity group	Protein		Fat	
	United States	Switzerland	United States	Switzerland
	Pounds		Pounds	
Meats & meat products	28.172	21.429	73.065	23.212
Poultry, fish, & eggs	9.275	3.164	5.321	2.293
Milk & milk products	20.888	32.041	39.356	44.361
Total livestock products	58.335	56.634	117.742	69.866
Cereals & potatoes	39.033	36.005	5.878	3.731
Fruits & vegetables	3.440	3.262	.980	1.800
Misc. fruits & vegetables	1.416	1.490	2.789	7.638
Vegetable oils & oil products	.020		14.703	
Total vegetables	43.909	40.757	24.350	13.169
Grand total	102.244	97.391	142.092	83.035

\* See Table XXXVI for consumption data and explanations and the footnote to Table XLIII for method of estimating the number of adult male units.

Table XLVI. - AVERAGE HUMAN CONSUMPTION OF DIGESTIBLE FOOD  
NUTRIENTS PER ADULT MALE UNIT AND PER CAPITA IN THE UNITED STATES  
1911-12 AND SWITZERLAND 1908-12 \*  
(Continued)

Commodity group	Carbohydrates		Calories	
	United States	Switzer-land	United States	Switzer-land
	Pounds		Number	
Meats & meat products	.141	.005	362,029	137,464
Poultry, fish & eggs	.001	1.493	40,000	18,337
Milk & milk products	25.313	38.532	252,680	278,628
Total livestock products	25.455	40.030	654,709	434,429
Cereals & potatoes	277.314	301.881	614,549	644,128
Fruits & vegetables	30.744	32.196	67,898	73,775
Misc. fruits & vegetables	113.648	62.577	226,247	151,369
Vegetable oils & oil products			62,219	
Total vegetables	421.706	396.654	970,913	869,272
Grand total	447.161	436.684	1,625,622	1,303,701

\* See Table XXXVI for consumption data and explanations and the footnote to Table XLIII for method of estimating the number of adult male units.



When the above estimates of digestible nutrients consumed in each country are divided by the total population, or by the estimated number of equivalent adult male units, the similarities are most striking. While the estimated total number of calories consumed in the United States in 1924-25 per adult man was 29 per cent larger than in Switzerland in 1920-22, it should be remembered that the waste of food nutrients in kitchens is probably much lower in Switzerland than in the United States. The most significant difference in these post-war estimates of consumption per man is for fat, the estimated amount for Switzerland being only 62 per cent of the United States figure compared with 82 per cent for carbohydrates and 88 per cent for protein. If, now, the deductions for waste in kitchens suggested by Pearl are made, the average number of pounds of calories of digestible nutrients per adult male unit for both countries would appear as follows:

	United States	Switzerland
Protein, pounds	97	89
Fat	98	84
Carbohydrates	373	382
Calories, number:	1,287,760	1,230,540

Even when these deductions are made, the actual consumption of fats in the United States appears to be larger than in Switzerland. Practically the same relationships are shown by expressing the estimates of consumption on a per capita basis for both countries.

Pearl's estimates of the consumption of digestible nutrients in terms of calories in 1911 divided by the estimated number of adult male units, computed by using the above United States scale for that year, shows a slightly closer relationship to estimates of consumption per adult unit for Switzerland from 1908-12 than the above post-war data. These pre-war comparisons are shown in Tables XLV and XLVI. The average number of calories consumed per adult unit in the United States, as estimated by Pearl for the crop year 1911-12, is slightly higher than the Bureau of Home Economics estimates for 1924-25. The Bureau estimates of consumption of protein and fat per adult unit are also slightly lower than Pearl's estimates for 1911-12; but both estimates for carbohydrates are practically the same. In Switzerland, however, the estimated consumption of protein and carbohydrates was slightly higher in the pre-war period than in the post-war period.

From the foregoing data many ratios, such as the conventional nutritive ratio for determining the proportion of protein in the diet,

the proportion of calories or protein coming from animal or vegetable sources and from various other divisions of the food budget, can be determined and used in studying relation of diet to occupation, climate, character of population and other significant differences between population in different countries.

Estimates can also be calculated in terms of digestible nutrients, or calories produced per acre.

Although, in the foregoing tables, data for certain years only are presented, there is no reason why a statistical service cannot be developed, which will make available data that can be used for constructing relatives for the foregoing ratios which can be used as a measure of trend within each country and of relative historical changes between countries. The relative which will perhaps be of most significance from the standpoint of food supply is that for total digestible nutrients, or energy values in food, or feed crops, per acre of land. Such an index would not, of course, include such crops as cotton and tobacco, but separate indices could be constructed for these if desired.

#### X. Timber Production and Consumption in Relation to Population

Concerning the consumption of forest products, the Schweizerische Oberforstinspektorat makes a yearly estimate of firewood and timber produced. By adding to this the net balance of exports and imports, the total consumption is obtained. As already pointed out, the 1929 census will return a much more accurate figure on the production of wood, which consequently will also make the figures on consumption more reliable.

The total quantity of timber cut in the United States in 1919 per capita of the total population was slightly larger than in Switzerland in 1925, as shown in Table XLVI-A. The quantity of lumber cut in the United States per capita in 1925, however, was probably much larger than in 1919 because of the reduction in the construction of buildings during the war and the resulting boom in later post-war years. The normal cut of timber per capita in the United States is probably 50 to 60 per cent greater than in Switzerland.

Estimates of the annual growth of timber are not available for Switzerland.\* The annual growth of wood "of all sizes and qualities" in the United States, however, is estimated by the United States Department of Agriculture at 6,039,000,000 cubic feet, and the total drain on forests is estimated at 24,786,000,000 cubic feet.

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\* The figures on annual growth of timber, as mentioned above, (p.227) do not apply to the whole country, but give merely an average, under the



Table XLVI-A. - TIMBER PRODUCTION PER CAPITA OF ALL POPULATION  
IN THE UNITED STATES 1879-1919, AND SWITZER-  
LAND 1925\*

Year	United States		Switzerland	
	Production* (m. feet b.m.)	Per capita production (m. feet b.m.)	Production (m. feet b.m.)	Per capita production (m. feet b.m.)
1925			1,212	.307
1919	34,552,076	.327		
1909	44,509,761	.484		
1899	35,077,595	.462		
1889	23,842,230	.379		
1879	18,091,356	.361		

following assumptions:

	Number of trunks per hectare	diameter centimeter	length meter	average growth/year cubicmeter
spruce	870	28.6	26.3	8.25
beech-trees	640	25.6	27.5	5.08

A figure similar to that of the U.S.A. is not available. About 87 per cent of the publicly owned forests, however, are managed according to scientific methods and plans. For those, figures of the possible cut per year have been worked out for several years ahead. In a special table of the Forststatistik, the actual yearly cuts are compared with the "possible" ones, which gives indication whether the drain on the forests in Switzerland is too large or not. (No figures are available for the privately owned forests).

- \* United States - Production data from United States Census, 1920, Volume 10, and Population data from Bureau of Census Reports.
- Switzerland - Schweizerische Forststatistik, 7. Lieferung, Heft 2, 1927 (quoted in Statistische Erhebungen und Schätzungen, etc. edition 1928, p.23) and population data from Census on population, 1920 (3,880,320), or estimate of the population for 1928 made by the Federal Office of Statistics (3,936,330).

Y. Budgets of Farm Families and Urban Families

Sources listed in Part I are Statistische Mitteilungen and Statistisches Jahrbuch der Schweiz, under the Eidgenössisches Departement des Innern; all the publications of the Union Suisse des Paysans; and Sozialstatistische Mitteilungen, under Arbeitsamt.

Cantonal sources of information are as follows:

Haushaltungsrechnungen aus der Stadt Winterthur und den Landgemeinden des Kantons betreffend die Jahre 1912, 1919 und 1920. (Statistische Mitteilungen betreffend den Kanton Zürich, heft 141).

Haushaltungsrechnungen von Basler Familien aus den Jahren 1912, 1919-1923. (Mitteilungen des Statistischen Amtes des Kantons Basel-Stadt No. 45).

The analysis of the farm accounts enables the Secretariat in Brougg to give some details on the expenditures of farm families. No attempts, however, have ever been made to work up the material available in the usual form of budget studies. The tables compiled by the Secretariat give, in the first place, an analysis of the household costs. Thus there is one table quoting cash expenditures for household purposes, the value of products obtained from the farm, wages and wage claims for work in the household, interest on household implements, and rent. In another table, the cash expenditures for the household are quoted for about 20 items, mostly food products. A similar table analyses the value of the farm products, and rent, and wage expenditures. Finally, a table of the cash expenditures of the family is compiled by objects of expenditures for about 15 classes including clothes, shoes, furniture, medical service, school attendance, etc. In the first tables mentioned, the figures are quoted for the "man-unit," while the last table is compiled for the family unit also. The "man-unit" is the basis adopted by the Secretariat. The scale is intended to represent working ability, and is not adequate for family budget analyses. It is as follows:

Males, 18 years old and over	1 unit
Females	.8 "
Boys from 16-17 years of age	.8 "
Workers under 16 years of age	.4 - .7 "

In spite of obvious defects, the tables are very instructive, especially because they now cover a period of almost thirty years. They also make comparisons between the five farm-size groups distinguished, although no definite conclusions should be drawn with respect to this without consulting the analysis of the sources of income. (See section F').



On budgets of "urban" families, several studies have been published lately in Switzerland. The Federal Statistical Office entered this field of work for the first time in 1919, working out an analysis of 277 family budgets. It obtained the collaboration of several statistical offices of cantons and cities, under whose control the record takers worked. These record takers were required to enter, on specially provided blanks, every expenditure and item of income and to deliver these records each month to their respective offices. The results were worked up according to a schedule agreed upon previously by all these offices. Returns which revealed abnormal conditions with respect to income or expenditures, and the returns of single persons were eliminated. Of the 277 records, 161 were taken in cities with over 100,000 inhabitants and 34 in towns with a population of more than 10,000. The remaining 82 records are not from places which can be called rural. But the Statistical Office has taken care to work up the returns in great detail. It has grouped the families according to the social status of their heads, according to their incomes, the number of children, etc. It has analyzed the income of the men, the wives and the children. It reports the interest on investments, rebates from purchases in cooperative societies, and gives detailed accounts of savings and also of withdrawals from accumulated savings.

For reduction purposes, the "consumption unit" was chosen, a scale adopted recently by several other European nations. It is not based on food consumption primarily, but also takes into account the relative needs of housing and clothes. It is as follows:\*

			<u>Male</u>	<u>Female</u>
Persons of	0 -	3 years	0.1	0.1
"	"	4 - 6 "	0.2	0.2
"	"	7 - 9 "	0.3	0.3
"	"	10 - 12 "	0.4	0.4
"	"	13 - 14 "	0.5	0.5
"	"	15 - 16 "	0.7	0.6
"	"	17 - 18 "	0.9	0.7
"	"	19 and more	1.0	0.8

\* This scale was first used by the Statistisches Reichsamt of Germany in investigations made in 1907. It was also used in a slightly altered form in investigations made by the City of Stockholm (Sweden) and in Finland. In 1912-14, it was used in family budget studies made in Vienna. Swiss statisticians also used it in the report Statistik der Stadt Zürich: Haushaltsrechnungen aus dem Jahre 1919, p. 8 and 9, from which this scale has been taken. The following sources are quoted therein:

Erhebung von Wirtschaftsrechnungen Minderbemittelter Familien im Deutschen Reich bearbeitet im Statistischen Reichsamte.

2. Sonderheft zum Reichs-arbeitsblatte, Berlin, 1909.

Wirtschaftsrechnungen und Lebensverhältnisse von Wiener Arbeiterfamilien in den Jahren 1912-14. Erhebung des K. K. Arbeitsstatistischen Amtes im Handelsministerium, Sonderheft zur Sozialen Rundschau 1916, Wien 1916.



The expenditures are analyzed in extraordinary detail. They are divided into 10 major groups, which again are subdivided into 38 classes. Special care was taken with respect to the expenditures for food products. Not less than 37 different food products are enumerated, and the expenditures for each of them is tabulated separately. Another table goes even further and analyses in still more detail the expenditures for meat. Moreover, seven regional groups have been formed. This enables one to make certain comparisons between urban and rural budgets. The results are reduced to the "consumption unit" as explained above, but for reasons of comparability with budget studies in 1912, the "Quet" scale is also used. Each table states which scale has been used.

During the years 1920-22, the Federal Labor Office conducted family budget studies, the results of which have since been taken as the basis for the construction of the cost of living index. The summary tables in Statistisches Jahrbuch der Schweiz, 1923, p. 282 ff. indicate that the same method was used by the Statistical Office as in 1919. The number of families included increased to over 300 in 1922. The proportion living in cities is also increased, which has resulted in a decrease of number of persons per family and also a slight decrease of consumptive units per family. Other family budget studies have been conducted by the Statistical Office of the City of Zürich.

The following is a critical examination of family food budget studies in the United States with a view toward their use in estimating the nation's food requirements:

In 1890 a study was made by the United States Department of Labor of 3260 families in the iron, steel, and cognate industries. This was followed in 1891 by a similar study of 5284 families in the cotton, woolen, and glass industries. The results of these surveys are published in the Sixth and Seventh Annual Reports of the United States Commissioner of Labor.

These surveys were made by similar methods. Personal agents gathered the facts from heads of families, on the basis of the latter's estimates. For food consumption analyses, only "normal" families were used. This limitation reduced the number of families to 1246 and 2019, respectively. A "normal" family was defined as one having no boarders or dependents, not owning its own dwelling place, having both a husband and wife, having not more than five children (none over 14 years of age), and having expenditures for rent, fuel, lighting, clothing, and food. The scale used for converting the results to comparable units was as follows:

	Consumption units
Husband	100
Wife	90
Children, 11-14 years	90
"    7-10    "	75
"    4- 6    "	40
"    1- 3    "	15



The families were, as a whole, well distributed both geographically and by occupations. The main criticism of these two studies lies in the fact that only the major items in the diet were included (potatoes, sugar, butter, etc.), and that no allowance was made for cows, chickens, gardens, etc., which some families owned and from which they obtained a part of their food. In other words, only purchased foods were included. This limitation in data collected would be likely to vary in its effect upon the result obtained for the different occupation groups.

In 1904, the United States Department of Labor undertook a more extensive study of "cost of living." The principal industrial centers of 33 states, including the District of Columbia, were surveyed. The geographical distribution was believed to be in proportion to the number of industrial employees. The survey was limited to persons on salaries not exceeding \$1200 per year, and was not to include persons engaged in business on their own account. Both native and foreign-born elements were included; also a considerable number of colored families. The data were gathered, by personal inquiry by experienced special agents, from the housewives, largely on the basis of estimates of consumption for the preceding year. The results were published in the Eighteenth Annual Report of the United States Commissioner of Labor.

The food consumption for 1043 selected "normal" families was obtained. A "normal" family, for purposes of this study, met the following requirements, of having

- Husband at work
- A wife
- Not more than five children, and none over 14 years of age
- No dependent, boarder, lodger, or servant
- Expenditures for rent, fuel, lighting, food, clothing and sundries

The consumption scale was very similar to the one used in the 1890 and 1891 studies.

Although this survey was better taken, and the results are undoubtedly more accurate and detailed than the earlier studies, there is the limitation that the sample was too small for the large area covered. For this reason, the results in themselves are not conclusive. Together with other similar studies they have some value.

The Bureau of Labor Statistics, in 1918-19, made a survey of white families in 92 cities or localities in 42 states, the cities varying in



size from New York to small country places of a few thousand population. These places were selected so as to get data representative of all parts of the country. In the selection of families, the stipulation was made that only families of wage earners or salaried workers were to be included. Families of men in business for themselves were not to be included. These data were also collected by personal surveys. The results are published in Bulletin 357 of the Bureau of Labor Statistics.

Following the same scale used in earlier studies, the results were reduced to the adult male equivalent basis. Only white families were included, and the sample was concentrated in the central income groups. Moreover, some weighting should have been given the results based on the relative number of families in cities of varying sizes.

The results were published in great detail, the average quantity of each of 128 articles of food consumed by 11,900 families, reduced to an adult male equivalent basis, being listed. Most of the items have been expressed in pounds, but many have been quoted in widely varying units. Milk in quarts, eggs in dozens, apples in pecks, asparagus in bunches, lettuce by heads, and cantaloupes by numbers are some examples.

The results of a number of local studies have been published in the Monthly Labor Review. In 1916-17, a survey was made in the District of Columbia and another at about the same time, in the chief shipbuilding centers. The National Industrial Conference Board made a survey in Lawrence, Massachusetts, in 1919, and another in Fall River. In these studies, the "cost" of living has been the center of interest, and the relative proportions of the income spent for food, clothing, shelter, etc. Consequently, value measurements alone, in most cases, have been employed. Quantitative measurements furnish the only fixed standard for the purpose in mind in the present analysis.

Several attempts have been made at working out some theoretical minimum budgets, but they are of little value for our use. They are used mostly in wage disputes.

Most farm family budget studies have been made by the United States Department of Agriculture or by individual states in cooperation with the Department of Agriculture.

In 1913-14, Mr. W. C. Funk of the Department of Agriculture collected data from 950 farm families scattered throughout the United States. The personal survey method was used, estimates being made where accurate records were not available. Areas in 14 states were included, so that the results were fairly representative of the United States as a whole. The sample is small, considering the large area covered and the variability in the results. Caution must therefore be exercised in generalizing on the results found.



Beginning about 1923, a series of studies on living conditions and costs of living among farm families in various localities of the United States was started. In 1924, preliminary reports were issued for selected localities in Iowa, Alabama, Ohio and Missouri. During 1925, similar reports were issued for other localities - Kentucky, Tennessee, and Texas. Still others have been issued since that time for other states.

The summary, made in 1923, of food consumed during one year by 1331 farm families of selected localities in Kansas, Kentucky, Missouri, and Ohio is one of the most complete available for the specific areas included. The data were collected by the survey method, specially trained agents visiting the housewives and obtaining estimates of food consumption for the preceding year. The number of adult-male units included in the study was calculated by the use of a double dietary scale which had been worked out in the Bureau of Home Economics.

	Age	For energy		For protein and minerals	
Adult male	18 to 60	1.2	100	1.1	100
Adult male	over 60	1.0	83	1.0	91
Adult female	18 to 60	1.0	83	.9	82
Adult female	over 60	.8	67	.8	73
Boy	15 to 18	1.2	100	1.6	145
Girl	15 to 18	.9	75	1.2	109
Child	11 to 14	.9	75	1.2	109
Child	6 to 10	.7	58	.9	82
Child	under 6	.4	33	.6	55

Several possibilities of errors are present in the results. The housewives' estimates were for the preceding year. In many cases they gave a consumption figure in volumetric terms, such as bushels of potatoes, baskets of peaches, etc. In some cases less standardized terms were used, such as number of squash and bunches of onions. These figures were reduced to pounds, and it is quite possible the conversion factor used was not correct. Moreover, the housewife has considerable difficulty in estimating foods furnished by the farm. This is especially true because of the fact that the foods are often of poor grade. The best grade of potatoes, for instance, may have been sold and those less uniform in size and quality used by the family. Still another source of error is the spoilage that occurs in stored foods, and the waste of food which is thrown out to the chickens and hogs. On the whole, however, it is believed that the results are fairly representative of the areas covered.

In 1924, a similar survey was made in Vermont of 86 farm families. In all respects the methods used were the same as in the 1923 study. The results are therefore subject to the same limitations. They are, however, probably representative of Vermont families for that particular year.

Many other studies which are not suitable to our needs have been made in various sections of the country. Areas in New York, Iowa, Alabama, Texas, Tennessee, and other states have been surveyed with the use of value measurements. As stated before, quantitative measurements are essential for estimating specific food requirements.

As to the use of these several budgetary studies in estimating the nation's food requirements, the preliminary analyses seem encouraging; but further study leads one to believe they are of relatively little value. In the first place, the quantities of specific foods consumed are highly variable, and necessarily so. Surely no more can be consumed than is available for consumption, which, in the case of most foods, is the production of a limited period. The results of the 1918-19 survey are, accordingly, very much influenced by the production of specific foods from 1917-19, and the results of the 1923-24 studies by production from 1922-24. A very good example of this is the consumption of pork. In 1918-19 hogs were scarce and the estimated per-capita consumption of pork, from production figures, for the United States was 54.8 pounds as contrasted to 74.7 pounds in 1923-24 - a difference of over 35 per cent.

Such variations make the comparisons of the results of studies taken at different times exceedingly difficult, if not impossible. Surely the differing food habits of Vermont farm families and urban wage earners is not readily deducible from surveys, one of which was made in 1924 and the other in 1919.

One further limitation in the use of these studies is the variable-ness of the classifications of items. For example, in the case of meats, veal may be a separate item by itself, included with beef, or given no specific classification and included in "other meat." Sausage may be a separate item or included under pork and beef. Many other similar discrepancies exist, especially in such items as fruits and vegetables.

Then, too, there are difficulties within given studies. Many food items are overlooked unless the questionnaire is sufficiently detailed. Too great detail, on the other hand, is likely to lead to inaccuracy in estimates. One can estimate fairly well how much meat one ate last year, but it is rather difficult to differentiate between the amounts which were pork, beef, mutton, lamb, veal, poultry, and fish. Specific quantities of the many varieties of fruits and vegetables would be still more difficult to estimate.

The accompanying table illustrates some of the disadvantages of surveys taken for a single year, and the lack of comparability of the results obtained from the same areas at different times. It seems clearly evident that, in order to obtain reliable consumption figures for the



Table XLVII. - COMPARISON OF SOME OF THE RESULTS OBTAINED FROM THE 1913-14 AND 1923-24 SURVEYS OF THE QUANTITIES OF FOODS CONSUMED ANNUALLY BY FARM FAMILIES IN OHIO

	Per family		Per person	
	1913-14	1923-24	1913-14	1923-24
Beef (pounds)	115	131	28.1	32.1
Pork "	706	375	172.2	72.2
Poultry "	301	95	73.5	23.4
Fish "	2	24	.5	5.8
Butter "	122	130	29.8	32.1
Milk "	2325	1902	566.9	467.8
Eggs "	237	219	57.8	53.9
Sugar "	377	382	92.0	93.9
Salt "	20.5	43	5.0	10.5
Rice "	26.2	14	6.4	3.6
Bread "	162.4	172	39.6	42.4
Flour "	754	675	184.0	166.0
Cornmeal "	86.1	47	21.0	11.6
Coffee "	38.9	31	9.5	7.7
Tea "	3.3	5	.8	1.2
Potatoes "	1380	1048	336.0	257.8
Sweet " "	24.6	86	6.0	21.2
Apples	10.7 bu:	452 (1b):	2.6 bu:	111.2 (1b)
Peaches "	141.9	99	34.6	24.2
Grapes "	11.5	42	2.8	10.3

Estimate of calorie requirements of the 1920 population of the United States based on the 1913-14 farm family survey of the Department of Agriculture and the 1918-19 urban family survey of the Department of Labor.

	Population	
	Farm	Urban
Total	31,000,000	74,700,000
Male	16,100,000	37,400,000
Female	14,900,000	37,300,000
Adult male	10,360,000	27,050,000
Adult female	9,390,000	26,970,000
Children, 10 to 14	3,610,000	6,440,000
Children, 5 to 9	3,820,000	6,970,000
Children, under 5	3,820,000	7,270,000

Reduction to adult male equivalent

Adult male	1.00	10,360,000	27,050,000
Adult female	.90	8,451,000	24,273,000
Child, 10 to 14	.90	3,249,000	5,796,000
Child, 5 to 9	.60	2,292,000	4,182,000
Child, under 5	.20	764,000	1,454,000
		<u>25,116,000</u>	<u>62,755,000</u>

25,116,000 X 4260 Calories (Funk) = 106,994,160,000  
62,755,000 X 2741 Calories (Labor Statistics) = 172,011,455,000  
 87,871,000 279,005,615,000  
 total calories

$$\frac{279,005,615,000}{87,871,000} = 3175 \text{ calories per man per day}$$



Estimate of calorie requirements of the 1920 population of the United States, by various food groups, based on the 1913 farm family survey of the Department of Agriculture and the 1918-19 urban family survey of the Department of Labor.

	Calories per man per day	
	Funk 1913-14	Labor Statistics 1918-19
Meat, fish, eggs	580	370
Milk, cream	400	204
Fatty foods	710	491
Sweets	500	250
Cereals	1280	1065
Fruits, vegetables	790	361
Total	<u>4260</u>	<u>2741</u>

Estimate of calorie requirements of the 1920 population of the United States, by various food groups, based on the 1913 farm family survey of the Department of Agriculture and the 1918-19 urban family survey of the Department of Labor. (Continued)

Number of adult units in 1920:

<u>Meat, fish, eggs</u>		
Rural	25,116,000 X 580 =	14,567,280,000
Urban	62,755,000 X 370 =	23,219,350,000
Total	87,871,000	37,786,830,000
		430 Average
<u>Milk, cream</u>		
Rural	25,116,000 X 400 =	10,046,400,000
Urban	62,755,000 X 204 =	12,802,020,000
Total	87,871,000	22,848,420,000
		260 Average
<u>Fatty foods</u>		
Rural	25,116,000 X 710 =	17,832,360,000
Urban	62,755,000 X 491 =	30,812,705,000
Total	87,871,000	48,645,065,000
		554 Average
<u>Sweets</u>		
Rural	25,116,000 X 500 =	12,558,000,000
Urban	62,755,000 X 250 =	15,688,750,000
Total	87,871,000	28,246,750,000
		321 Average
<u>Cereals</u>		
Rural	25,116,000 X 1280 =	32,148,480,000
Urban	62,755,000 X 1065 =	66,834,075,000
Total	87,871,000	98,982,555,000
		1126 Average
<u>Fruits, vegetables</u>		
Rural	25,116,000 X 790 =	19,841,640,000
Urban	62,755,000 X 361 =	22,654,555,000
Total	87,871,000	42,496,195,000
		484 Average
<u>Total</u>		
Rural	25,116,000 X 4260 =	106,994,160,000
Urban	62,755,000 X 2741 =	172,011,455,000
Total	87,871,000	279,005,615,000
		3175 Average



United States as a whole, budget studies need to cover a period of time no longer than a single year, and need to be made during comparable periods for all areas and groups of people.

Furthermore, reliable material is not available for comparing the food requirements of various occupational groups. The steel worker, the painter, the salesman, and the merchant obviously have different food needs.

This estimate of 3,175 calories of food consumed per day by the average adult male in 1920 is considerably below the above estimate of 4,439 calories for 1924-25 based upon estimates of production, waste, feed, and seed, and imports and exports. Both estimates are based upon the quantity of nutrients in food purchased. The probabilities of error in sampling and in the estimates of purchases of quantities obtained from the farm or garden by a relatively small number of families, however, are much greater than in the above estimates of production of food products and their disposition. In fact, these results indicate that the estimates of food consumption obtained in these budgetary studies are below. This result, however, is not unreasonable in view of the fact that the original estimates of family purchases or quantities obtained from the farm or garden are obtained at one time for the entire year. It seems likely that housewives would tend to underestimate rather than overestimate the quantities of food used during an entire year, when obtained in this way.

Similar data for both urban and rural families are not available for Switzerland. From 1919 to 1922, however, some budgetary studies were made of the food consumption in urban families. These data were classified according to the managers, other officials and employees, skilled laborers, and unskilled laborers. The conditions under which these studies were made have been pointed out in another part of this section.

A summary of the results obtained in these two analyses of food consumption for 1919 and 1922 that are of most significance for international comparisons are given in Table XLVIII.

These data show some significant differences between occupation groups. For example, the consumption of eggs per person in the families of managers was more than 50 per cent higher in 1922 than in the families of unskilled laborers. Meat, including sausage, was 11 per cent higher, but the consumption of bread, flour and pastry was 7 per cent lower per person in the families of managers than in those of unskilled laborers. Other differences in the consumption of these occupation groups are apparent in the table. They represent, however, only an indication of the actual differences in these occupation groups, since the difference in character of families in each group are not taken account of in these results. Comparisons of the consumption of most foods per capita in urban families of the United States and Switzerland can be included, if desired.

Table XLVIII. - AVERAGE ANNUAL CONSUMPTION OF IMPORTANT FOODS PER PERSON IN A NUMBER OF URBAN FAMILIES IN 1919 AND 1922 IN SWITZERLAND, CLASSIFIED BY OCCUPATION GROUPS IN 1922 (1) and (2)

	Total		Managers
	1919	1922	1922
1 & 2 Milk & cream	477.71	489.04	470.49
3 Butter	8.17	14.03	18.22
4 Cheese	9.56	8.82	8.90
5 Eggs	52.56	124.51	174.52
6 Fat (animal)	9.61	7.85	5.64
7 Meat	43.32	42.16	46.98
a. Beef	17.73	16.99	17.06
b. Veal	2.06	6.78	8.90
c. Pork	3.75	12.47	14.45
d. Mutton	.36	.48	0.93
e. Horse	.46	.32	0.00
f. Other meats	3.39	3.23	3.73
g. Edible offal	2.06	1.88	1.91
8 Sausages	11.05	14.36	13.75
9 Fish	.87	1.34	2.05
10 Bread	181.97	165.99	164.30
11 Pastry	12.64	13.93	17.15
12 Flour	15.88	15.54	18.88
13 Grits	3.13	3.60	4.33
14 Cornmeal	5.50	2.43	3.22
15 Rice	8.63	5.91	8.44
16 Oats & barley	4.16	4.19	5.31
17 Other cereals	1.13	1.99	1.40
18 Macaroni, etc.	15.67	13.82	12.72
19 Olive oils	1.50	2.17	1.84
20 Fats (vegetable)	1.54	2.31	4.43
21 Fruits	168.40	165.83	165.27
22 Oranges, etc	6.27	11.99	19.81
23 Preserves	4.06	2.74	1.77
24 Honey	1.34	1.51	0.98
25 Sugar	34.48	43.12	44.65
26 Cocoa & chocolate	5.14	3.66	2.70
27 Vegetables	56.06	59.26	76.90
28 Vegetables (legumes)	10.02	12.15	12.30
29 Potatoes	156.38	129.05	119.22
30 Coffee, etc.	4.57	6.24	8.39
31 Tea	.20	.32	0.51
32 Wine	16.28		

(1) Statistisches Jahrbuch der Schweiz, 1924, p. 266.

(2) Schweizerische Statistische Mitteilungen, 1922, Vol. I, p.156.

For "consumption unit," see p. 270.



Table XLVIII. - AVERAGE ANNUAL CONSUMPTION OF IMPORTANT FOODS PER PERSON IN A NUMBER OF URBAN FAMILIES IN 1919 AND 1922 IN SWITZERLAND, CLASSIFIED BY OCCUPATION GROUPS IN 1922 (1) and (2)  
(Continued)

	Other officials and employees	Skilled laborers	Unskilled laborers
	1922	1922	1922
1 & 2 Milk & cream	487.04	493.55	444.20
3 Butter	15.94	11.84	10.18
4 Cheese	8.84	8.79	8.79
5 Eggs	129.74	113.59	113.14
6 Fats (animal)	6.57	9.80	6.60
7 Meat	43.92	40.64	34.27
a. Beef	17.16	17.02	14.73
b. Veal	8.43	4.72	6.07
c. Pork	12.56	12.80	8.26
d. Mutton	0.52	0.36	0.13
e. Horse	0.12	0.61	0.54
f. Other meats	3.26	3.20	2.77
g. Edible offal	1.86	1.93	1.78
8 Sausages	14.31	13.87	17.94
9 Fish	1.57	1.07	0.67
10 Bread	154.03	176.77	187.39
11 Pastry	15.59	11.58	13.61
12 Flour	15.82	15.09	12.90
13 Grits	3.90	3.35	2.68
14 Cornmeal	2.09	2.74	2.90
15 Rice	6.11	5.64	4.02
16 Oats & barley	4.54	3.86	2.14
17 Other cereals	2.38	1.73	0.85
18 Macaroni, etc.	13.09	14.88	13.57
19 Olive oils	2.60	1.83	1.53
20 Fats (vegetable)	2.21	1.93	3.61
21 Fruits	187.13	147.72	119.02
22 Oranges, etc.	14.72	8.33	8.88
23 Preserves	2.56	2.95	3.61
24 Honey	1.86	1.22	0.98
25 Sugar	46.94	39.27	37.40
26 Cocoa & chocolate	3.96	3.35	4.10
27 Vegetables	64.86	53.79	36.55
28 Vegetables (legumes)	11.63	13.10	9.19
29 Potatoes	126.63	133.19	127.41
30 Coffee, etc.	6.28	6.15	4.86
31 Tea	0.35	0.25	0.31
32 Wine			

(1) Statistisches Jahrbuch der Schweiz, 1924, p. 266.

(2) Schweizerische Statistische Mitteilungen, 1922, Vol. I, p.156.

For "consumption unit," see p. 270.

## Z. Imports and Exports of Farm and Forest Products

### A'. Commercial Fertilizer: Production, Imports and Exports

Sources in Part I are the various publications listed under the Finanz-und Zolldepartement, the Zolldepartement, and the Union Suisse des Paysans; also Schweizerische Statistik and Waaren-Ausfuhr aus der Schweiz nach den Vereinigten Staaten, listed under the Statistisches Bureau; Statistisches Jahrbuch der Schweiz [Vol. I, 1891, contains figures on imports and exports of livestock, dairy products, and meat from 1877 to 1884 (p.57), also a table on imports and exports of cattle for the period from 1851 to 1886 (p.70-71). More figures on imports and exports for the period 1885-1889 are given on pages 102-119, and Statistische Mitteilungen, (see especially Fabrikstatistik vom 26. September 1923. 1924 Heft C), listed under Eidgenössisches Departement des Innern; Beiträge zur Statistik, under the Departement des Innern; Wirtschaftliche und Sozialstatistische Mitteilungen, under the Volkswirtschaftsdepartement; and Annuaire Agricole de la Suisse.

Other sources of information are as follows:

Statistik des Schweiz. Waarenverkehrs von 1850-1884,  
zusammengestellt vom Schweiz. Handelsdepartement, 1887.

Handwörterbuch der Schweiz. Volkswirtschaft. Artikel:  
Handelsstatistik.

Data on imports and exports of food and other agricultural products are needed to combine with those of domestic production in order to arrive at a figure for domestic consumption, as was done in section V above. They are also important as indicating directly the trends in the balance between food production and food consumption. In interpreting them, due account must, of course, be taken of the fact that certain types of foods are bound to be imported into the United States and Switzerland anyway, coffee, tea and bananas for example, and an excess of imports over exports may arise largely from such items.

Swiss statistics of imports and exports date as far back as 1850, when the first tariff law for the recently united country went into effect. Figures for imports and exports of earlier years are collected in Beiträge zur Statistik der Schweiz. Eidgenossenschaft, Vol. 5: Statistische Übersicht über den Handel der Schweiz mit dem Auslande ... Bern 1858. The method of collecting trade statistics has been continuously improved. Special care has been taken from the very beginning, however, to separate the goods imported for use in Switzerland from the goods imported for transit only. The enumeration according to different categories of merchandise was not very detailed at the start, especially for goods in



transit and re-exported goods. Goods on the free list were partly not enumerated at that time, and the list of goods included in the statistics was not the same for exports and imports. In 1877, these defects were mostly remedied.

Before 1877, the goods were classified according to their method of measurement. Table A included the goods enumerated per piece, such as beehives, asses, foals, calves, mules, horses, neat cattle, goats, sheep, hogs of less than 80 kilograms, hogs over 80 kilograms, and other animals not carried on a wagon. Table B included goods valued, such as agricultural implements of wood and iron, wagons of all kinds and timber. Table C included goods weighed. The basic unit was the "horse power," which equaled 750 kilograms; but for some goods, the unit was 50 kilograms. This category included farm products mostly. The imports and exports of commodities on the free list were reported in a special table, and goods imported for transit in another. Because many cattle were imported into Switzerland for pasturing on the mountains in the summer, a separate classification, in 9 classes, was provided for these. The list of other goods imported for transit does not coincide with the list of goods imported for consumption. A final table reveals the amount of goods imported for storage only and their re-export.

The main classification used in the present Swiss statistics is briefly as follows:

1. Special trade: this includes -
  - (a) Imports for consumption or use in the country, separated into those stored and those not stored before consumption.
  - (b) Exports of goods of Swiss origin - goods re-exported not included.
2. Transit: Goods in transit plus goods imported and stored in warehouses and re-exported.
3. Goods imported for consumption but re-exported later on.
4. Temporary imports and exports for improvements.
5. Local trade along the boundaries. (A large part of this, however, is included under special trade).

The law which contains the detailed provisions as to the method of collecting the statistics is reprinted in the introduction to Statistik des Waarenverkehrs. The valuations declared for imported goods represent the



value of the commodity at the place of its manufacture, plus freight costs to the place of import (Swiss tariff duty not included), and for exported goods, the same value plus transportation to point of export. With the expansion of foreign trade, the number of countries for which this trade is separately recorded has been continuously increased, until it is now 51. As far as possible, the country of final destination of the commodity shipped has to be stated on the export declaration. The reports are published monthly and quarterly, and summarized in more detail yearly, especially in a Jahresbericht, issued by the Oberzolldirektion, which is in charge of trade statistics. This report contains numerous charts and tables, and is a very valuable guide in obtaining a general idea of the exports and imports of the country and its connections with the foreign markets. The commodities are classified under three main headings: food products, raw materials, and manufactured goods. Farm products appear in all three groups. Fertilizers in their raw stage come under raw materials; but if they have already gone through a manufacturing process, they are classified as manufactured goods. An alphabetical list of all the commodities can be found at the end of Volume I of Statistik des Waarenverkehrs (in German and French).

No figures are available as to the production of commercial fertilizers in Switzerland. The federal census of factories, taken in 1923, listed, in the general class of chemical factories, 19 which were producing salts, acids and fertilizers, employing about 12,000 workers, and using about 3060 horsepower. No data on production are given. It is known, however, that the production of fertilizers was started in Switzerland in 1862, and early export statistics reveal a considerable export of such products. (See Handwörterbuch der Schweiz. Volkswirtschaft, Artikel: Chemische Industrie, Vol. I, p. 726). A series of figures on imports of fertilizers since 1850 can be found in Volkswirtschaftslexikon der Schweiz, Vol. I, p.460.

During the year 1930, 11 members of the League of Nations have ratified the "International convention relating to economic statistics," which was drafted by the International Conference relating to Economic Statistics, in December 1928. The 11 countries are: Egypt, Bulgaria, Canada, Denmark, Greece, Great Britain and Northern Ireland, Irish Free State, Norway, Sweden, Switzerland, and the Union of South Africa. The convention came into force on January 1, 1931. Its purpose is to secure uniformity in the fields of already existing statistics, and to induce the countries to enter upon new kinds of statistics.

Annex 1 deals with External Trade Statistics. In Part I, the general principles are laid down, and definitions given of "special imports," "special exports," "general trade," "transit trade," "improvement trade," "repair trade," etc. It also contains the principles of the valuation of the trade, adopting the system known as "declared values." Other sections require the countries to give precise definitions of the meaning of terms,



such as "gross weight," "net weight," and other units of measure. Finally, there is given a definition of the territory to which the statistics shall apply, and the civil calendar year (January 1 to December 31) was adopted as the "statistical year."

Part II consists of a list of countries, giving the "statistical territories to be shown in the returns of trade," and in Part III, general principles and definitions are laid down with regard to the classification of goods according to "countries of origin or production," "countries of consignment or provenance," "countries of purchase," etc.

The ratification of the Convention by Switzerland requires some changes in the method of compilation of trade statistics in this country. The changes will be introduced gradually. While the new classification of imports and exports, with respect to the drafted list of statistical territories, will not be started until 1932, the changes with regard to the classification of imports and exports into special trade, transit trade, etc. were introduced January 1, 1931. They are very few.

Up to now, nationalized goods (goods imported and re-exported without transformation, such as raw coffee, raw cotton, raw silk, etc.) have been recorded separately when being exported. Their quantity and value was deducted from the imports, in order to obtain the imports for consumption. According to the convention, "special exports shall include all exported goods produced within the territory or nationalised therein." No separate record of exports of nationalized goods, therefore, will be taken any longer. The customs department estimates, on account of this change, an increase of about 80 to 90 millions of francs in the yearly values of imports and exports.

With regard to the declared values of exported goods, the convention requires that "export duties shall be included" in the declared values. This has not been done until now. Because only a few export duties are levied in Switzerland, this change in the method does not affect the results of the returns very much.

Of more importance is the requirement of keeping special records of imports and exports of gold coin, gold in bars for inter-bank transactions, and other gold (for manufacturing purposes). Up to now, all trade in gold, except in gold coin, was included in "special trade."

New for Swiss trade statistics also is the compilation of records of "direct and indirect transit trade." The transit trade was already recorded. From now on, a separation of the indirect transit trade from the direct one has to be made, the indirect trade being defined so as to include "all goods coming from territories external thereto, which are entered into warehouses or depots, actual or constructive, ... and subsequently exported therefrom, without being placed at the free disposal of the importers, and without having



undergone transformation, repair or supplementary treatment other than re-packing, sorting or blending." Direct transit trade "includes all goods passing through ... for purposes of transport only ..."

The United States has rather complete data on imports and exports of all products, collected by the Customs Department of the United States Government, and assembled into convenient classifications by the Department of Commerce, in its monthly and annual summaries of foreign commerce and navigation. The more important data are also published in the Yearbook of the United States Department of Agriculture. The Bureau of Agricultural Economics has established index numbers for aggregate imports and aggregate exports, and for the principal classes of each for the period since 1910, which are also published in the Yearbook of the United States Department of Agriculture.

### B'. Power on Farms

Part I lists, as a source, Ergebnisse der Eidg. Betriebszählung, under Schweizerische Statistik, published by the Statistisches Bureau.

In any analysis of the food production and food producing possibilities of a nation, account must be taken of the extent of the use of power. The substitution of tractor power for horse power in the United States has released a large acreage of land for production of human food, and is, in considerable degree, responsible for the fact that exports of agricultural products from the United States are greater now than before the World War. Power also releases human labor to be used in other ways in food production. It may make possible the utilization of land that could not be profitably cultivated with simple tools or even horses.

The first census of agricultural machinery in Switzerland was taken in 1905, when the schedule of the farm census included, in section D, questions with regard to power on the farms, and the number of agricultural machines in use. The returns of that census do not, however, represent either the real amount of power, or the real number of machines on the farms. Question 10 of the schedule simply asked whether or not mechanical power was used, regardless of ownership of the motor, with the result that the same motor may have been counted several times. The same uncertainty applies to question 11, where the machines had to be named "which were in use on the farm during the last 12 months." Cooperative ownership of certain types of machines is very common in Switzerland. On the other hand, where several machines of the same type were on the farm, only one was counted for each farm.

Question 10 also asked for the amount of horsepower of the following types of motors: water, steam, electric and other motors. The results are tabulated in Table 10 for the whole country and for each canton, with farms



grouped according to their size in the usual way. The returns from the same question for the agricultural industries, such as cheese and butter factories, cider factories, etc., are given in the same table, but in a separate column.

Question 11 asked whether one of the following machines was used on the farm: drills, mowers, hay-turners, hay-rakes, steam threshing machines, other threshing machines, milk separators. The results are tabulated in Table 12, which also gives figures on the number of farms which have 2 or more of these machines and special combinations of them.

In Table 11, the farms using motor power are classified in 11 groups, according to the number of people working on them, with the number of horsepower obtained from each type of motor stated for each group as a total and by sub-groups (less than 1 HP., 1-2, 3-5, etc.). This table therefore makes it possible to compare the amount of man power and horse power on these farms.

No information is available as to the power obtained from work animals on the farms. As pointed out above (section K), horses, very frequently oxen, and even cows are used. Figures on the number of horses on farms have been available since 1901.

The defects and the inaccuracy of the 1905 schedule are completely remedied in the schedule for the 1929 census. This time it was asked: "What kinds of motors belonging to the farm are being used in 1929?" The number of types of motors is analyzed, and includes the following: electric motors, water wheels and turbines, steam engines, diesel engines, gasoline engines, wind mills, tractors, small motor cultivators for gardens, other motors, as for example, grinders driven by horses, fish boats with motors, fish boats without motors. For each of these types of motors, the number of horsepower it is able to develop has to be stated. Farmers are required to give the number of such motors used on the farm. In order to obtain information on the number of farms which have no motors but are temporarily using motors of other farms or of a cooperative society, another question asks whether or not motors not belonging to the farm are used during the year.

As to machines in use on the farms, the number of each kind belonging to the farm is asked, as well as the number of such machines rented from other farms, or from cooperative societies. The number of types of these machines was also increased by adding potato diggers, milk separators, grain mills, fruit presses and distilleries, and two questions concerning the machines for the transport of timber in the forests. The addition of these two questions, as well as the questions concerning the number of fish boats, is due to the fact that no special schedule was used for the forest enterprises and fisheries, as in the 1905 census. Questions concerning both of these industries have been embodied in the schedule for agriculture (see section D).

Any appraisal of the amount of power on farms in the United States can be no more than a rather crude estimate. The available data on the subject are quite limited, and often but fairly accurate. Quite possibly, the best attempt to analyze what data are available, and to arrive at what appears to be a fairly accurate estimate of this factor, was made by Kinsman\* of the Department of Agriculture in 1925. Kinsman considered work animals, tractors, motor trucks, stationary engines, windmills, and electric power in arriving at his final figure of 16 million horsepower-hours used annually. His omission of the automobile because of its relative unimportance seems highly questionable. The automobile is a much more important source of power on farms than is generally recognized.

Kinsman presents data showing the average number of horsepower-hours used annually per worker, per farm and per acre of improved land, and per hour of human labor, for the United States and each of the states separately, also tables giving estimates of the relative amounts of power from different sources and used for various types of farm work. The following tables from his study are also interesting:

Estimated Total Primary Horsepower Available on Farms  
of the United States from 1850 to 1924 inclusive

1850	7,000,000	horsepower
1860	10,000,000	"
1870	10,000,000	"
1880	14,000,000	"
1890	20,000,000	"
1900	23,000,000	"
1910	32,000,000	"
1920	44,000,000	"
1924	47,000,000	"

Horses or Equivalent Power  
per Worker

Italy	0.19
Hungary	0.39
France	0.37
Belgium	0.38
Germany	0.55
United Kingdom	0.88
United States	2.05
Alabama	0.81
New York	1.69
Indiana	2.46
Iowa	3.86
Nebraska	4.71

\* C. D. Kinsman - An Appraisal of Power Used on Farms in the United States. U.S.D.A. Department of Agriculture Bul. 1348.



In the United States, the census has not concerned itself with a general enumeration of the different types of farm machinery on farms, merely asking for an estimate of the value of all farm machinery at the time of the taking of the census. If indices were available showing changes in the prices from one census period to another it would be possible to get a rough estimate as to changes in the total physical quantity of farm machinery. Since the development of gasoline power, however, the United States census has concerned itself especially with the extent of its use. The 1930 census has questions directed at the use of automobiles, motor trucks, tractors, stationary gasoline engines and combines, and two directed at the use of electricity on farms.

Among the supplementary questions recommended by the International Institute of Agriculture for the World Census is the following on farm machinery:

State the number of the following machinery on this farm on the date of the census:

1. Ploughs.
2. Harrows.
3. Seeders.
4. Harvesters.
5. Threshers.
6. Power machines.

#### C'. Use of Fertilizer in Agricultural Production.

Data on the use of commercial fertilizer in agriculture are important in analyzing the production of food and other agricultural products. The future expansion of agricultural production is dependent upon available supplies of fertilizer almost as much as it is upon additions to agricultural land. For a country like Switzerland, where the land has already found as intensive use as is likely to arise, unless the world's population becomes much more congested, the availability of fertilizer is more important than land supply. Switzerland collects no real data on the use of commercial fertilizer.\* The United States census has included a question on the amount expended for fertilizer, since 1880. The 1930 census contained a specific question concerning the quantity of commercial fertilizer, excluding manure, marrow,

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\* An estimate of the fertilizer consumption in Switzerland is published in the Statistical Yearbook of the International Institute in Rome. Many fertilizers are not produced in the country. The import figures are, therefore, taken as the amount consumed.

lime and limestone. Records of fertilizer tonnage sold annually in each state from 1909 to date are also published in Cornell University Memoir 119, Prices of Fertilizer Materials and Factors Affecting the Fertilizer Tonnage by Edmund Ellsworth Vial. These data are taken from the American Fertilizer Handbook. The tonnage of fertilizer sold in each state and in the United States as a whole may be compared with the total land in crops, and also with the acreage of the principal crops using fertilizer (cotton, tobacco, potatoes and vegetables), in order to obtain a measure of change. There has been an upward trend in consumption per acre of all crops and of the principal fertilizer-consuming crops since 1909, although 1925 and 1930 were on about the same level for all crops. The increase in acreage of cotton west of the Mississippi, where very little fertilizer is used, actually produced a reduction in the consumption of fertilizer per acre of the fertilizer-consuming crops between 1920 and 1925.

No direct questions regarding the uses of fertilizers were included in the World Census schedule. The International Institute of Agriculture, however, recommended that data on the kind and extent of fertilizer used be obtained directly from farmers or by "inquiry of the manufacturers of fertilizer, dealers, and inspection of licensing of the national and provincial governments."

#### D'. Prices of Farm Products.

Sources in Part I are all the publications listed under the Union Suisse des Paysans and the Preisbildungskommission; also Statistisches Jahrbuch, listed under the Eidgenössisches Departement des Innern; Wirtschaftliche und Sozialstatistische Mitteilungen and Rapports Économiques de la Feuille Officielle Suisse de Commerce, under the Volkswirtschaftsdepartement; Beiträge zur Statistik, under the Departement des Innern; and Annuaire Agricole de la Suisse.

Two cantonal sources are Statistisches Jahrbuch für den Kanton Bern, 1866 ff. Vol. 1-10, and Mitteilungen des Kantonalen Statistischen Bureaus des Kanton Bern 1883 and following year. Other sources of information are:

Zeitschrift für Schweiz. Statistik, 1929, p. 372.

Berichte über den Internationalen Markt für Milch und Molkereiprodukte. Herausgegeben von der Preisberichtsstelle des Schweiz. Bauernverbandes. (The International Market of Milk and Dairy Produce).



Schweiz. Landwirtschaftliche Marktzeitung. Herausgegeben von der Preisberichtsstelle des Schweiz. Bauernverbandes. (Revue Suisse des Marches Agricoles).

Die Grundlagen der Periodischen Statistischen Erhebungen des Eidg. Arbeitsamtes. Bern, 1929.

Collecting data on prices of farm products is important for present purposes for several reasons. First, such data are needed in order to combine the physical quantities to give value estimates, and also in order to combine with value figures in the construction of various types of indices. In the second place, trends in prices of farm products indicate changes in the relative scarcity of farm products. For a part of the farm products produced in any country, these trends are likely to be world wide, differing in one country from another, only because of differences in transportation costs and location with respect to markets and sources of supply. The rest of them are locally produced and consumed, and indicate a degree of scarcity in each country by itself.

Since 1909, the Swiss Farmers' union has maintained a Price Inquiry Office, which conducts a very intensive information inquiry in regard to prices of farm products throughout Switzerland. It has about 9000 collaborators, so called crop reporters. Not less than 77000 card-questionnaires were sent out from the office during the year 1928. As far as possible, special cards are provided for each kind or group of farm products. The reporter is asked to state the prices prevailing in his town, village or district. The prices reported are monthly wholesale prices, but very frequently the reporter is asked also to give "retail" prices received by the farmers for a large number of agricultural products, such as potatoes, eggs and fruits sold by the farmers to the consumer directly.

The results of these inquiries are published weekly in the Schweizerische Landwirtschaftliche Marktzeitung, which has a circulation of about 125,000 copies. It is printed in French and German. In addition, the price situation is broadcast twice weekly from three radio stations. In the weekly report, the prices are quoted in great detail, separate quotations being given for each canton, and sometimes even for special sections of cantons. The cantons are also grouped geographically into regions, average prices for these regions being published. This is the case also with the yearly summary, which gives the prices for 14 regions. This summary is published in the Statistisches Jahrbuch, and in other publications. A clear distinction is made between wholesale prices and "farmers' retail prices." Some of the quotations for milk and dairy products' prices are also published in the Statistisches Jahrbuch. A much more detailed



quotation may be found in the *Milchstatistik der Schweiz*, published yearly in the *Landwirtschaftliches Jahrbuch*.

At this point, attention should be drawn to the fact that, during the World War, the dairy farmers in Switzerland were very well organized and that, in consequence thereof, the Association of Milk Producers was able to negotiate a basic milk price for almost the whole country. Up to 1929, prices were established for three months in advance. Since May 1, 1929, they have been established for periods of six months, although, under exceptional circumstances, the price can be altered within this time. The longest period in which no alteration was made was from November 1, 1927 to October 31, 1929.

The prices actually reported by the farmers differ slightly from the basic price negotiated because of special conditions. In one table, three prices are quoted, one for milk for consumption, one for milk delivered to cheese factories, and one for milk delivered to condenseries. Such prices are quoted only for a limited number of cantons. In a second table are given average prices for the whole for each quarter of the year, and for the whole year, and in much detail as to different kinds of milk. Group "A" gives first the retail price in the larger towns and cities, second, the retail price for house delivery in other places, and third, the retail price for milk called for by consumers at the cheese factory.

It should be mentioned that the milk is not retailed in bottles, but in bulk. In group "B", two prices are quoted, one the wholesale farm price for milk used for direct consumption, the other the price for the same kind of milk delivered at the consuming center. Groups "C" and "D", finally, give the prices for milk delivered to cheese factories and condenseries. The prices in these tables are quoted in centimes per kilogram, in the preceding tables, in francs per 100 kilograms.

The report also contains a table of average monthly retail prices compiled by the Federal Labor Office (see below), from inquiries in 34 of the larger places of the country, and, in addition, the separate figures for the eight largest cities. These prices are quoted per liter. The retail price applies to house delivery. These average monthly retail prices apply to all the milk retailed, regardless of whether it is controlled by the Association of Milk Producers or not. The price quotations referred to in the preceding paragraph are collected by the Swiss Farmers' Secretariat, and apply, with a few exceptions, to milk controlled by the association. As the price of the other milk is very closely correlated with that of the milk handled by the association, the quotations can be considered as representative for the whole country, although, for statistical purposes, they cannot be taken as complete.



This difficulty is more serious for the prices quoted for butter and cheese. As for cheese, the figures furnished by the Landwirtschaftliches Jahrbuch are those paid producers by the Association of Milk Producers, which are also fixed for at least three months in advance. If losses arise, they have to be borne by the Association. For export types of cheese, the selling prices of the Swiss Cheese Union, the central body of all exporters of cheese, are quoted in detail; and in a separate table, the domestic selling prices, fixed by the same organization. Two other tables give average monthly retail prices of cheese for 34 places and separate retail prices at 11 selected markets, for the third month of each quarter of the year. These latter quotations apply to cheese which is not under control of the central selling organization.

For butter, "free market" quotations are available, the Price Inquiry Office making use of returns from its reporters. Another table quotes the prices of the "butter exchange," the buying and selling agency of the Association of Milk Producers. The prices are those paid to producers at butter factories. Both tables include figures for three different qualities of butter. The tables quote retail prices to consumers in detail. One of these tables is compiled by the Federal Labor Office, and gives monthly averages and a yearly average in francs per kilogram of butter. Earlier prices for milk and dairy produce can be found in the Jahresberichte des Schweiz. Milchwirtschaftlichen Vereins, and reprinted for the years 1893-1912 in Mitteilungen des Bernischen Stat. Bureaus 1913 Lief. I, p.216/17. On page 212/13 of the same publication, cheese prices are quoted as far back as 1622.

The Price Inquiry Office in Brougg makes special inquiries as to the international situation concerning milk and dairy products, and summarizes the results quarterly in The International Market of Milk and Dairy Produce (an abbreviated edition of the German and French editions), which undertakes an international survey of the market in these products, quoting the prevailing prices in the various countries. For Switzerland, the average prices for the country, as discussed above, are quoted.

The secretariat has constructed an index for the price movement of farm products as far back as 1870. The average prices of the years 1900 to 1909 have been taken as the base. These indices are published yearly in the Untersuchungen betreffend die Rentabilität der Schweiz. Landwirtschaft. The Secretariat has also constructed index figures on the base of the average prices of 1914, which are to be found in Statistische Erhebungen. This index was made in order to facilitate comparisons with other indices constructed on this base. The index numbers are constructed by weighting the relatives for each product according to the percentage it represents of the gross value of agricultural production.\*

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\* See sections E' and F' for this figure.



The Federal Labor Office has just started publication of a general index of wholesale prices (January 1928). The method of its construction is explained in detail in Die Grundlagen der Periodischen Statistischen Erhebungen des Eidg. Arbeitsamtes. The commodities are raw materials, except for a few half-finished products. The commodities are classified into 10 groups, which are given weights based on their estimated consumption in value terms (average of monthly prices) for the years 1926/27. The individual commodity in each group is weighted in the same way. The following table gives the weights for Group I. The total value used for all products is Fr. 2,031,000,000. The weight for Group I is 39.3.

Group I: Food products from animals

Milk	Fr. 430,000,000	Weight 44.1
Butter	" 90,000,000	" 9.2
Eggs	" 65,000,000	" 6.7
Neat cattle	" 240,000,000	" 24.6
Hogs	" 120,000,000	" 12.3
Fat	" 30,000,000	" 3.1
Fr. 975,000,000		Weight 100.0

The prices used for imported goods are taken f.o.b. at the place of import (tariff duties are thus included). Those of domestic goods are collected at the end of each month from a considerable number of manufacturers and other producers. (A copy of the questionnaire used is appended to the publication already mentioned.) The base years are 1926/27, but to facilitate comparison, the Office is also computing the same index on the base of 1914. These indices are published monthly in Wirtschaftliche und Sozialstatistische Mitteilungen, and reproduced in Statistisches Jahrbuch der Schweiz.

This same Federal Office also started a very extensive price reporting service for retail prices in 1922, and reorganized it in 1926. This index is now recognized as the official index of the country, 34 cities, towns and larger villages collaborating in preparing it. Some of these units have their own statistical offices doing the field work; in others, public officials collect the data. But all collect the data according to uniform instructions on schedules provided by the Federal Office. (A copy of this schedule is printed in Die Grundlagen der Periodischen Erhebungen etc. p. 21). For foodstuffs, two kinds of prices are asked for, those in stores and those in the markets; and for both of these, a minimum, the most frequent, and a maximum price are required. The stores included are distributed all over the towns, and the same stores are included each time. The prices have to be given for a certain



quality of the product as stated on the schedule. This is an attempt to get all the differences between the retail prices of different stores. The inquiries are made at the end of each month. The index constructed out of these returns is not a general index of retail prices, but, as the Office points out, an index of cost of living. It does not make use of all the commodities for which prices are returned, and derives its quantities to be used as weights from family budget studies made in 1912, 1920 and 1921. Although budget studies have not been made in all of the communes for which the prices are returned, the Office has made up, for each commune, a separate table of quantities consumed. The price quotation used is the "most frequent price in stores," as obtained from the schedules used.

The Office also collects, in a similar way, data on prices of fuels and clothes, and on rents. The total cost of living index is weighted as follows:

Food stuffs	57 points
Fuels	7 points
Clothes	15 points
Rent	21 points
<hr/>	
Total	100 points

These cost-of-living index figures are published monthly in *Wirtschaftliche und Sozialstatistische Mitteilungen*, and reproduced in *Statistisches Jahrbuch*. Besides the combined index for the whole country, a separate index for the large cities and the smaller places is published. Other index figures on retail prices are quoted in *Statistisches Jahrbuch*, one of these being compiled by the central bureau of the Association of Consumers' Cooperative Societies, the other by the statistical offices of some of the larger towns. The base years of these vary, which makes accurate comparisons impossible.

The Secretariat in Brougg is collecting for its own purposes, data on prices "farmers have to pay," but has published no index series. Instead, several tables are set up which compare the prices of equivalent quantities of a number of products before and after the World War.

Much material on prices of more purely historical value is available in the country. To give only one example, in the *Statistisches Jahrbuch der Schweiz*, 1891, a table may be found containing maximum and minimum prices of wheat on the market in Zürich, for the years 1540 to 1839. Farm prices can be taken from the censuses on production of the Cantons Bern, Zürich, Vaud and others; but these represent only prices



prevailing in the fall, and for only a partial list of agricultural products.

Several statistical offices of cantons have also collected data on retail prices. For example, the office of the Canton Bern has figures from 1878 on, and some still earlier figures can be found in Statistisches Jahrbuch für den Kanton Bern, 1868, for the years 1865 and 1866. These arise from an attempt to establish a price-reporting service over the whole canton, which was later limited to the city of Bern. From 1909 to 1916, this office extended its inquiries concerning retail monthly and yearly prices of meat to 22 larger places of the whole country. The prices are for "that kind of meat which is most usually consumed," for statistical purposes a very vague definition indeed. Wholesale prices of meat (at the slaughter house) have also been collected, but unfortunately not on a uniform basis, so that only limited comparisons can be made between the different towns. These and other defects were remedied by the inauguration of the federal price reporting service described above.

In the United States, the prices received by producers in their local markets have been collected for a number of years through the reporting system of the Bureau of Crop and Livestock Estimates, and have been published as "farm prices" as distinguished from "wholesale prices" of farm products at the central markets. In determining the state farm price of an important crop, the price reports from each district are averaged, and these district averages are weighted by the number of acres of that crop raised in each district in the last year for which the data are available. In combining the farm price for all states into a United States monthly farm price for each product, the state prices are weighted according to the latest estimate of the production of each crop, in the case of crops, and according to the number of head of each class of livestock on farms January 1, in the case of livestock and livestock products.

The Bureau of Agricultural Economics in the United States has developed prices for each of the important types of farm products, and combined these relatives into index numbers, using as fixed weights the physical volume of production for a recent period.

#### E'. Value of Agricultural Production

Sources in Part I are all the publications listed under the Union Suisse des Paysans; and Statistisches Jahrbuch der Schweiz, listed under the Eidgenössisches Departement des Innern.

Cantonal sources include:

Mitteilungen des Bernischen Statistischen Bureaus, 1885 ff.  
Landwirtschaftsstatistik.



Statistische Mitteilungen betreffend den Kanton Zürich, 1878-1909.

Statistique Agricole du Canton de Vaud 1881-1919, 1895-97.

Another source of information is:

Handwörterbuch der Schweiz. Volkswirtschaft, Vol. III-I.

No figures are regularly published by the Secretariat in Brougg which can be interpreted as "value of agricultural production." The nearest approach to this is made in the statistics of the Cantons of Bern and Vaud and, in earlier years, for several other cantons. The schedule in use in Bern for obtaining data on production includes a question as to the average price paid in the commune for each farm product. Although the number of these farm products is far from complete (milk and meat are omitted, for instance), the results are very valuable. The Statistical Office of Bern computes an average price for each district. Multiplying this price by the amount of the crop harvested gives the total value. These statistics date back to 1885. Similar figures are available for the Canton de Vaud from the eighties to 1919, and for the Canton Zürich from 1883 to 1907. For shorter periods, and mostly only for selected crops, figures are available for other cantons. Thus, there exists a series of values of the tobacco crop in the Canton of Fribourg, from 1885 to 1910. Estimates of the value of fruit crops have been made by the Cantons Aargau, Thurgau and Schaffhausen. The Canton de Vaud is the only canton which is able to furnish an adequate figure for a period of years as to the value of the milk produced. In the Canton Bern, inquiries were made in 1885, 1893 and 1911 only. The results of the Canton Zürich are incomplete, and represent more the income of agriculture as an industry from the production of milk than the total value of the milk produced. In all these inquiries, the value of the butter and cheese produced was also ascertained.

An estimate of the value of the milk and dairy products in 1900 for the whole country can be found in Handwörterbuch der Schweizerischen Volkswirtschaft, Vol. III-I, p.81. The only attempt to estimate the value of the milk alone was made by the Secretariat for the years 1922-23. The production data discussed above were multiplied by the average price for the season, compiled by the Price Inquiry Office. The price is the farm price as reported for each kind of milk delivered (milk for consumption, milk for condenseries, etc.). The value of the milk fed to livestock on the farm was computed by applying the price paid for milk delivered to cheese factories. In the same publication (Mitteilungen No. 81, p. 14), estimates of the value of the milk production for each year of the census of livestock, 1866-1921, can be found. No explanation, however, is given as to how these figures were computed.

As mentioned in section N of this report, the Federal Office of Statistics is collecting yearly figures on the wine crop. The reports

also contain the average price at which the wine was sold, and out of these figures the total value of the crop is computed. The table is published in Statistisches Jahrbuch der Schweiz, and can also be found in Statistische Erhebungen und Schätzungen, etc.

It will be apparent that a useful estimate of the total value of agricultural production of Switzerland could be made by combining the data on prices now being collected with those being collected on production; or by combining the index of prices of farm products with one that might be constructed for the physical production of farm products. But there would be a number of gaps in the data, a few of them rather large, such as that for the production of hay; and this, no doubt, has deterred Swiss students from undertaking such combinations.

In contrast to Switzerland, the United States makes an effort, with each census, to obtain estimates of the value of all of the different crops and livestock products. These are obtained in part by the enumerator as a result of asking for both quantity sold and receipts from sales for the same product, and in part are supplied by the Bureau of Crop and Livestock Estimates, from the sources above indicated. Every year, the United States Department of Agriculture estimates the value of each agricultural product and the total value of agricultural production. The most complete summary for this appears in the July number of Crops and Markets.

#### F'. Agricultural Income

Sources in Part I are Recherches relatives à la Rentabilité de l'Agriculture, and Statistiques et Évaluations Agricoles, listed under the Union Suisse des Paysans.

The important other sources of information are:

- Notz, Emil - Die Rentabilitätserhebungen des Schweiz. Bauernsekretariates. Zeitschrift für Schweiz. Statistik, 1927.
- Laur, E. - Grundlagen und Methoden der Bewertung, Buchhaltung und Kalkulation in der Landwirtschaft, II Auflage, 1922.
- Laur, E. - Terminology and Basis for an International Agricultural Statistic founded upon Farm Accounting.
- Laur, E. - Der Einfluss des Weltkrieges auf die Lage der Landwirtschaft. Zeitschrift für Schweiz. Statistik, 1921.



Zaugg, Fritz - Die Rentabilitätserhebungen des Schweiz.  
Bauernsekretariates. Brougg 1923.

Switzerland has extensive records from books kept by farmers. For almost thirty years, the Farmers' Secretariat in Brougg has worked up the books of individual farmers, all of whom have taken a 3-day course of instruction in Brougg. These courses are given free of charge. Moreover, the members are boarded and lodged free, and get their railway fare paid. In turn, the farmer pledges himself to keep books according to a prescribed method for at least one year, and to submit his record for an analysis by the Secretariat. If he does not keep to his agreement, he has to refund to the Secretariat the expenses of the course. For his first year of correct bookkeeping, he is rewarded with a diploma, a subscription to an agricultural journal, and a small amount of money. Special rewards are given to farmers who finish their book accounts for a longer period of years. The number of accounts worked up by the Secretariat varies between 400 and 500. Up to 1927, about 7000 records had been included in the study. After being worked up and analyzed by the office, the books are returned to the farmers.

It may be questioned whether 500 farms a year furnish a sufficient basis for conclusions for the whole country. The total number of farms as returned by the census of 1905 was about 240,000. The percentage of farms under control is therefore very low, even if the 100,000 small holdings of 0.5 hectare to 3 hectares, none of which is represented by a book account, are left out. The Secretariat claims, however, that the results would not differ very much if larger numbers of accounts were analyzed.\* It admits that the farms under record do not represent proportionally all the regions of the country and that especially the mountainous parts of Switzerland are very poorly represented. From investigations made by Dr. Notz, it appears that the average size of farms under record is about 13.8 hectares, while the average for all farms of the country is only 8.57 hectares. The frequency distribution of the size groups included in the survey is very different from that in the farm census, as can be seen from the following tables:

Size groups	Percentage of farms	
	Farm census 1905	Survey in 1924
3 - 5 ha.	32.13	7.9
5 -10 "	38.72	39.3
10-15 "	13.79	22.4
15 -30 "	10.29	24.3
30 and more ha.	5.09	6.1

\* For a discussion of this problem and an investigation into the possible deviations of averages, see W. Pauli: Produktions-Kostenberechnungen in Bäuerlichen Betrieben, Archiv für Exakte Wirtschaftsforschung, VII. Ergänzungsheft, and Notz, in Zeitschrift für Schweizerische Statistik, 1927, p. 59.

Size groups	Percentage of land in farms	
3 - 5 ha.	9.42	2.2
5 - 10 "	20.35	21.0
10 - 15 "	12.46	19.5
15 - 30 "	15.47	35.9
30 and more ha.	42.33	21.4

This difference in distribution has a decided effect on the results. Dr. Notz and the Secretariat are of the opinion that the results obtained are likely to be above the average, in view of the fact that only the better type of farmers are ready to take up the work of keeping book accounts. The method of accounting is very simple.\* An inventory is taken at the beginning and the end of the crop year (March 1 to February 28). In addition, the farmer keeps record of all cash transactions on the farm, and the housewife notes in a separate book all ingoings and outgoings of the household. No records of the actual production on the farm are kept. The books are summarized in the office in Brougg. The farmer himself does not make any calculations of profits. Each farm for which books are kept for the first time is visited by an employee of the office in Brougg, in order to take notes as to the special conditions, as to fertility of the soil, intensity of cultivation, market facilities, etc. The book accounts are primarily intended to furnish data on the cost of production and profitableness of farming. Not less than seven different income figures are worked out. They are as follows:

	Percent distribution 1908/26
1. Household income from boarding	
(a) The family	7.25
(b) Hired labor	1.98
(c) Others (boarders)	0.20
2. Income from investments and work not performed on the farm	13.53
3. Family farm earnings	<u>77.04</u>
4. Gross income of the farm	100.00

\* The method is explained in full detail in Laur's Grundlagen und Methoden der Bewertung, etc. and in brief in Terminology and Basis, etc. The book contains also a description of the principles involved in taking the yearly inventory of the farm. On the method of summarizing and tabulating the accounts, see Notz, Zeitschrift für Schweizerische Statistik, 1927, and Zaugg, Die Rentabilitätserhebungen 1923.



The three remaining income figures are combinations of those given, as for instance, gross income of the farm minus household income from boarding the family, etc. That the household income is still further analyzed (wage claims, interest on kitchen utensils, rent) was explained in section Y.

It may be of interest to know that Item 2 is also subdivided into separate figures for income derived from investments and for income derived from labor outside the farm. In 1926, the percentage distribution of this figure was 34 percent wages, and 66 percent income from investments. The analysis of the wage figure is not carried so far as to reveal the amount earned in agricultural and in industrial work. The family farm earnings are explained by the following formula:

$$Ff = (Ie - Ia) + (Eg - Ag) + (Nl - Nb)$$

Ff = Family farm earnings.

Ie =

Ie - Ia = Increase or decrease of the net agricultural capital

Ia = (without cash balances)

Eg = Cash receipts of farm

Ag = Cash expenses for farm

Nl = Contributions in kind from the farm

Nb = Contributions in kind to the farm

Stating it more simply, the family farm earnings are made up of net cash income from the farm plus the value of the contributions in kind\* from the farm (food and house rent), plus increases or minus decreases in the value of the inventory. No tables are compiled of "income available for purchases." There is, however, a very close approach to it in the table analyzing the cash expenditures of the farm family. (See section Y of this report). Owing to the large proportion of the total income of the farm which is not derived from agriculture, this latter table is not very adequate for international comparisons. For such purposes it seems best to rely on the income figures, and to take either family farm earnings or family farm earnings plus household income from boarding hired labor and boarders. The Secretariat also computes the labor income of the farmers by deducting from the family farm earnings a computed interest on the farmer's own capital, at the rate at present of 4 1/2 percent. Up to 1920, the rate was 4 percent.

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\* The value of the food obtained from the farm is computed on the basis of farm prices. For comparison with urban incomes, the same computation is made on the basis of market values.



As in the computation of the total land values of the country (see section G<sup>1</sup>), Laur has made a computation of the total income from agriculture (family farm earnings plus household income) for the periods 1906-13, 1914-18 and 1901-18. The results are subject to criticism; in view of the unequal representation of the farms under record of all the farms in the country. It should especially be remembered that no accounts are taken on the 100,000 small holdings of 0.5 - 3 hectares, and that this class is thrown together with the class of farms of 3 - 5 hectares of land.

The Secretariat computes yearly figures of the total gross income of agriculture as an industry. These represent the value of the agricultural products sold from the farm plus the value of food produced and used on the farm. The table contains separate figures for the principal crops and livestock products, as for instance, wheat production, wine culture, dairy products, etc. These figures are computed in different ways, and are all merely estimates. Some of the basic figures are, however, reliable. For wheat, the deliveries to the Federation and the amount consumed on the farm (human consumption) are known (the Federation pays bounties). For potatoes, the estimate is based on an estimate of consumption; for milk, the total production is estimated and the amount of milk used and consumed on the farm (feed and human consumption) deducted, etc.

Comparison with the United States of the gross and net incomes of farm operators, persons gainfully employed in agriculture and of the farm population in different countries may be considered from the standpoint of the income of these from agriculture alone, or of their income from both agricultural and non-agricultural industries.

The gross income of farm operators from agriculture should include the sale of farm products produced on farms, plus the value of food products obtained by the family from the farm. The total gross income of these operators should also include the income from investments and work in non-agricultural industries. Reliable estimates of the total income of farm operators from non-agricultural enterprises are, however, not available for the United States or Switzerland.

The gross income from agriculture of persons gainfully employed in agriculture, and of the farm population, should be worked out in the same way as for farm operators. If total income of each group is wanted, however, it should include the income from investments, work and other sources in non-agricultural industries, in addition to the income from agriculture. For instance, the income of laborers classified as gainfully employed in



agriculture from non-agricultural sources should be included. In some countries it would also be necessary to include the wages of persons working in non-agricultural industries, in estimates of the income of the farm population. Of course, the value of work in agriculture done by persons classified in other industries should also be deducted in estimating the total income of each population group, or at least in estimating net income.

The net income of farm operators from agriculture may be estimated for the United States from data published by the Bureau of Agricultural Economics, by deducting from the gross income from agriculture, defined above, the wages paid for hired labor (cash and perquisites), operating expenses, interest on capital and debt, and rent paid to non-farmers. Taxes are usually deducted in obtaining net income, but since these taxes are taken to pay for services and goods furnished by the government, they may be interpreted as representing a part of the farmer's net income. A considerable part of the services represent consumption goods. Furthermore, countries may vary widely in the extent to which services and goods are furnished by the government.

It should be noted that the rent and interest paid to non-farmers are specified here. The Bureau of Agricultural Economics uses the term non-operator in place of non-farmer. These terms may or may not signify the same thing. H. R. Tolley's article in the Journal of Farm Economics, January, 1929, indicates that they are the same.

It should also be noted that the net income figures arrived at in this manner do not include wages received by the various members of the family for work on other farms.

The total net income of farm operators would also include income from work and investments of the farm operator and family in non-agricultural industries as well as in agriculture. Such an income figure is needed for accurate comparison of the income of farm operators in different countries. In some countries the income of farm operators and their families from non-agricultural industries may constitute a large part of their total net income.

Farmers keeping book accounts in Switzerland in 1926 reported 6.75 percent of their net income (gross income minus wages paid, operating expenses, interest paid to non-operator, rent paid to non-operator, taxes) as wages for work off the farm in both agricultural and non-agricultural industries. This percentage is also probably below the average for Switzerland since, as explained above, only the better farmers keep book accounts, and some of the operators of small farms keeping books received about twice as large a percentage of their net income in



the form of wages from work off the farm. In the United States, Mr. J. I. Falconer reported in the Journal of Farm Economics for June, 1929, that, in an area more or less typical of one-fourth of Ohio, around 25 percent of the total income of farm operators is received for work in non-agricultural enterprises.

If income is to be used as a basis for comparing the standard of living of farm operators in different countries, the level of prices, and size of farm operator family must also be considered.

Estimates of net income from agriculture, published by the Bureau of Agricultural Economics, do not, apparently, include or make it possible to include the wages received by the farm operator and his family for work in non-agricultural industries or on other farms than the one operated, or the income of these operators from investments in non-agricultural industries, although the income from investments in the agricultural industry other than on the farm operated is apparently included.

It should also be noted that the estimates of income published by the Bureau of Agricultural Economics include the computed value of farm products produced but not sold. In other words, during a period of high prices, when farmers are building up their herds of livestock, they would be selling less than their total production. Often the income from actual sales of this accumulated production will be less than the earlier estimated value of production. On the other hand, during a period of declining or unprofitable prices, farmers may dispose of more than they produce in a given year. Actual production in these years would, however, be valued at current prices. Fluctuations in the carryover of crops may also result in similar difference between the estimated value of production for sale and cash sales. The gains and losses on carryover from year to year, however, may be expected to average out over a series of years. In making a historical comparison; however, for periods including 1920 and 1921, it should be observed that the carryover of wheat, and probably cotton, was very high. Since this carryover was sold at much lower prices than prevailed in the years of production, estimates of income worked out on the basis used by the Bureau would have been correspondingly too high.

A rough estimate of the net income from agriculture of persons gainfully employed in agriculture may be made for the United States by deducting from gross income from agriculture only the operating costs, and rent and interest paid to non-farmers, as published by the Bureau of Agricultural Economics.\* In order to obtain the total net income of

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\* The wages paid to hired laborers classified as gainfully employed in other industries should also be deducted, but this figure is not available.



these workers, however, their income from work, investments, etc., in non-agricultural industries would also need to be included. These data, however, are not available.

The above estimate of net income for persons gainfully employed in agriculture is probably the best that can be made on the basis of data now published by the Bureau of Agricultural Economics for the farm population.

The major part of data necessary for the determination of the net income of the families of farm operators of the farm population and of persons gainfully employed in agriculture could be gained by a few additions to the 1929 census schedules.

For farm operators and their families, question 52 of the farm schedule "How many days were you (the farm operators) gainfully employed in work not on the farm you operate?" would need to be changed to include members of the farm operator's family. In order to estimate their net income from agriculture it would also be necessary to ask the number of days worked on other farms and in non-agricultural industries.

For the farm population and gainfully employed in agriculture groups, number of months worked in agriculture and non-agricultural industries would need to be obtained. The income, other than wages of these groups from non-agricultural industries, is much more difficult to obtain and is probably not very important.

International comparisons of the incomes of people engaged in agriculture are, however, limited to a large extent by the lack of adequate measures of difference in price level or the purchasing power of these incomes. For this reason no comparisons have here been made between the United States and Switzerland. Differences in the methods used in making current estimates of agricultural gross and net incomes in both countries, however, have been pointed out in an earlier section of this report.

#### G'. Land Values

Sources listed in Part I are Recherches relatives a la Rentabilité de l'Agriculture, and Statistiques et Évaluations Agricoles, under Union Suisse des Paysans.

The important other sources of information are as follows:

Laur, E. - Der Einfluss des Weltkrieges auf die Lage der Schweiz. Landwirtschaft. Zeitschrift für Schweiz. Statistik, 1921.



Fahrländer, M. - Die Bewegung des Schweiz. Volksvermögens von 1913-1919.

Laur, E. - Grundlagen und Methoden der Bewertung, Buchhaltung und Kalkulation in der Landwirtschaft. 2. Auflage, 1922.

One of the clearest evidences available as to intensity of land use and scarcity of food is the relative level of rents and land values in the country. Statistics with respect to these, however, are poorly developed in most countries. Not much work has been done so far in collecting data on land values and land prices in Switzerland. The Secretariat in Brougg has compiled a series of land values as obtained from the farm bookkeeping records. The values stated in these records are inventory values. The Secretariat estimates that they represent about 75 percent of the actual market prices of the land.\*

Intensive studies of land values and the prices at which land is purchased and sold could be made from the cadastres, where exact records are kept of all dealings in real estate. Local studies of these records have been made very frequently, usually with the view of ascertaining the mortgage indebtedness of agriculture.

In Statistische Erhebungen und Schätzungen, etc., two tables may be found containing estimates of the total value of the agricultural land for the whole country. One was made by the Secretariat in Brougg for the years 1911, 1919 and 1926 (edition of 1929, p. 61); the other by Dr. Fahrländer for 1913 and 1919 (edition of 1929, p. 67). Both are based on the returns of the farm bookkeeping records and the acreage figure as obtained by the farm census of 1905. But the Secretariat makes its estimates on the basis of the reported inventory values of the land, while Dr. Fahrländer capitalized the net returns, at the rate of interest commonly paid on mortgages, and distributed the total assets obtained on land, buildings, etc., according to the percentage of values revealed by the book accounts. Another source of the difference in the results is that Dr. Fahrländer took the acreage as returned by the farm census, while the Secretariat thought it necessary to reduce the census acreage of pasture land by 7 in order to obtain a figure such that the acreage covered by the book accounts could be considered to represent it. (For a short discussion of the representativeness of the book accounts, see section E'). The results differ very much, the estimate of the Secretariat for 1919 being 3810 million francs, that of Dr. Fahrländer 4,995 million francs. Both

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\* For a statement on the principles applied in the evaluation of the land, see E. Laur - Grundlagen, etc., p. 29.



methods are open to criticism. The method adopted by the Secretariat has the advantage that it can be used every year. The yearly fluctuations in the net return make it necessary, if Dr. Fahrlander's method is used, to use a period of years, in order to obtain an average which can be capitalized. This method furthermore involves the difficulty in selecting the rate of capitalization, and of allowing for the factor of capitalization of anticipated change in net returns. Net income itself can only be a rough estimate.

The United States census has collected data on land values since 1850. Only since 1900, however, have separate values been obtained for land and buildings. The separation is made on the basis of the farmers' estimates and in such a way that buildings have been overvalued and the land undervalued in parts of the United States where land values were declining at the time. Buildings were probably overvalued in the 1925 census and will be again in the 1930 census in a large part of the country.

The Bureau of Crop and Livestock Estimates has been collecting data on the values of land in farms and plow land in farms since 1914. The results are now published annually in a publication called the Farm Real Estate Situation of the Division of Land Economics of the Bureau of Agricultural Economics. Since 1920, the census has also collected data on cash rents, but they have not been published in the census reports. The cash rent data for 1919 have been rather well analyzed in United States Department of Agriculture Bulletin No. 1224, Relation of Land Incomes to Land Values, by C. R. Chambers.

#### H'. Interest Rates on Loans to Agriculture.

Sources listed in Part I are Statistiques et Évaluations Agricoles, and Recherches relatives à la Rentabilité de l'Agriculture, under the Union Suisse des Paysans; and Statistisches Jahrbuch der Schweiz, under the Eidgenössisches Departement des Innern.

Another important source is Zeitschrift für Schweiz. Statistik, 1914 ff.

Data on interest rates on loans to agriculture are collected to some extent by the Secretariat in Brougg. A table is published yearly in the report on the farm bookkeeping records. The table can also be found in Statistisches Jahrbuch. The data are obtained from an inquiry in which 30 cantonal banks and several private banks are included. The rates recorded are those charged on mortgages. Before 1922, the average was an arithmetic one; since then, it has been weighted. The Secretariat points out that commission charges are partly included in these rates. All of these banks also finance urban property, which, of course, influences the average rate of interest very much.



In 1929 the Federal Statistical Office undertook an inquiry with the same basis as to the rate of interest charged. The interest rates charged on agricultural mortgages were separated from those charged on mortgages on urban property. Moreover, for both classes the rates were quoted for first and second mortgages and the latter were again subdivided into two classes, those mortgages with a special security and those without any special security. All the rates are given for the years 1919-1928. (See Statistisches Jahrbuch der Schweiz, 1929, p. 203).

No data are compiled for interest rates on short loans to agriculture and for interest rates on loans on livestock. The National Bank of Switzerland discount rate and other money rates, however, are quoted in great detail in Statistisches Jahrbuch, and the bulletins of the leading banks of the country. (See also Tabellen zur Schweizerischen Konjunkturstatistik, Zeitschrift für Schweizerische Statistik, 1914 ff.).

The censuses of the United States have obtained statements as to the rate of interest paid on mortgage debts since 1890.\* The only other data available are in specific inquiries that have been sent out by the Bureau of Crop and Livestock Estimates, and published in bulletins 334 and 1047 of the United States Department of Agriculture under the titles, Costs and Sources of Farm Mortgage Loans in the United States, and Farm Mortgage Loans by Banks, Insurance Companies, and Other Agencies. For the census of 1890, however, a rather exhaustive inquiry was made on the mortgage debt situation, and interest rates were collected in considerable detail.

## II. Wages of Farm Labor

Sources in Part I are Statistiques et Évaluations Agricoles and Publications 1-99, listed under the Union Suisse des Paysans.

Cantonal sources are as follows:

Statistische Mitteilungen betreffend den Kanton Zürich, 1905  
No. 1: Landwirtschaftliche Arbeitslöhne im Kanton Zürich.

Statistik des Kantons St. Gallen. No. 18: Landwirtschaftliche Arbeitslöhne 1899.

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\* 1920 Census of Agriculture.



Other important sources are:

Löhnung der Landwirtschaftlichen Arbeiter im Kanton Wallis. (Salaire des Ouvriers Agricoles dans le Valais par le Département de l'Intérieur du Canton du Valais) in Zeitschrift für Schweiz. Statistik, 1908/2, p. 35 (in German and French).

Siegrist-Scheitlin-Landwirtschaftliche Lohnstatistik im Kanton Schaffhausen in Zeitschrift für Schweiz. Statistik, 1903.

Gilliéron-Duboux - Les Salaires Agricoles dans le Canton de Vaud. Zeitschrift für Schweiz. Statistik, 1889.

Die Bar - und Akkordlöhne und die Arbeitsverhältnisse in der Schweizerischen Landwirtschaft. Enquête vom Jahre 1929/30.

There is a definite inverse correlation between wages of farm labor and density of farm population and intensity of agriculture, which makes data as to farm wages significant to the purposes in hand. No official statistics on wages in agriculture are available for all Switzerland. However, several cantons have made investigations in this field, the Canton Zürich in 1902/03, the Canton St. Gallen in 1899 and the Canton du Valais in 1907. Some private investigations are also available for the Canton de Vaud and for the Canton Schaffhausen. While the investigations made by the cantons were restricted to the wages of the respective crop years, the authors of the other investigations have compiled wage-tables for as many years as possible (in one instance, back to the 17th century). Comparisons are not possible between all of these cantonal returns, because of differences in the method applied. (Some inquired for maximum and minimum wages, some for average wages).

The most extensive of the investigations into the wage situation for agricultural labor were made by the Farmers' Secretariat in Brougg in 1906, 1921 and again in 1929-1930. The secretariat has an agent in each commune of the country to whom a questionnaire was sent. The returns are not complete, since out of 3025 communes approached in 1920, only 2119, or 70 percent, reported. Nevertheless, the results obtained give the best information on agricultural wages available. The questionnaire was drawn up in great detail. Question 1 related to hired laborers employed by the week. Nine different classes were distinguished. Day laborers were distinguished according to the number of meals they obtained on the farm, and the wages paid in summer and winter time were asked separately. For all these classes of laborers, simply the average cash wage paid in the commune before the War and in 1921 was requested. No attempt was made to obtain an estimated value of board and



lodging furnished to hired labor by the farms. Question 2 dealt with the yearly salaries of farm managers and of employees of such large farms. In section 3 of the questionnaire, finally, piece rates were requested for more than 29 kinds of agricultural tasks. The results are commented upon very extensively by the Secretariat. The rates before the War and in 1921 are always compared. Some doubts may be expressed as to the exactness of the pre-War figures. No comparisons are made with the returns of the enquête of 1906.

The enquête conducted in 1929/30 by the Farmers' Secretariat - no questions relating to wages of farm labor were provided on the census schedule in 1929 - was chiefly a repetition of the inquiries made in 1921. The questionnaire was somewhat enlarged and several new questions added. But the results can well be compared with those of the earlier enquête. Moreover, the returns are more complete than those of 1921, as the number of communes for which returns were obtained increased from 2119 to 2335, or from 70 to 77 percent.

Together with this enquête, the Secretariat conducted an inquiry relating to the social conditions of farm labor. Although the questionnaire was submitted to only a small number of reporters (431), and reports had to be given for only two classes of hired farm labor, the results can be taken as representative. Among the questions put to the reporters, the following may be listed: Hours of the working day, time left for meals, working hours on Sundays, holidays (number), are farm laborers insured against sickness, against accidents, etc.? The results are worked up in detail and commented upon extensively, and are often compared with the results of a similar enquête made in 1909.

Cash wage rates of different classes of agricultural workers are also published yearly by the Secretariat in its report on the farm account books. Although taken from a very limited number of farms, these figures represent fairly well the general level of agricultural wages. These farm records enable the Secretariat also to compute an average figure of the value of the perquisites (board and lodging) as received by the hired laborer. Thus some sort of comparison can be made between agricultural wages and those paid by other industries. (See: Mitteilungen des Schweiz. Bauernsekretariates No. 98, p. 65, where such a comparison is made).

The Division of Crop and Livestock Estimates of the U. S. Bureau of Agricultural Economics and its predecessors have collected data on farm wages since 1866. The earliest data were published in a special report of the Bureau of Statistics, under the title Wages of Farm Labor in the United States: Results of Nine Statistical Investigations from 1866 to 1892. The yearbooks of the United States Department of



Agriculture have also published these data. They appear currently in Crops and Markets. Since 1924, an inquiry has been sent out four times a year. In the United States 1930 census, farm operators were also asked to state the number of days of farm work done by hired laborers in 1929 (exclusive of housework), and the amount expended in cash in 1929 for this farm labor. In earlier censuses, farm operators were asked to state only their expenditures for farm labor.

No question regarding wages of farm laborers is included in the standard form of the World Census schedule. For those countries desiring to collect data on wages of farm labor, the International Institute of Agriculture suggested the following questions:

	<u>In summer</u>		<u>In winter</u>	
	Male	Female	Male	Female
A. Workers by the day				
1. Average rate paid per hour	\$	\$	\$	\$
B. Workers by the month				
1. Average amount paid in money per month per worker.	\$	\$	\$	\$
2. Average amount paid in kind (food, fuel, lodging, etc.) estimated equivalent money value.	\$	\$	\$	\$

#### J'. Land Tenure

Sources in Part I, listed under the Statistisches Bureau, are Eidgenössische Betriebszählung, 1905 Vol. 2/2, and Eidgenössische Volkszählungen, 1888-1920, Vol. 3.

Other important sources, one cantonal, are as follows:

Handwörterbuch der Schweiz. Volkswirtschaft: Artikel: Grundbesitzverteilung.

Volkswirtschaftslexikon der Schweiz: Artikel: Landwirtschaft.

Grundbesitzstatistik des Kantons Bern nach der Aufnahme von 1888. Mitteilungen des Bernischen Statistischen Bureaus, 1890, Lieferung II.



The form of tenure under which land is held is definitely related to the density of the agricultural population. There is also a definite relation between distribution of tenure and distribution of income and consumption as between social groups. The information available on land tenure in Switzerland is not entirely satisfactory. Two principal sources must be consulted: the farm census of 1905, and the population censuses from 1888 to 1920.

The farm census of 1905 does not reveal the number of tenants. The operator was merely required to state for whose account he was running the farm. From this, the exact number of farms operated for the account of individuals, family partnerships, companies, incorporated enterprises, cooperative societies, communes, districts, cantons, the Federation, etc., was obtained. In question 12 of the census schedule, however, a statement was asked for as to the acreage owned, rented or being held in usufruct from the commune. The total number of farms was divided according to tenure of land - (Farms with owned land only, farms with rented land only, farms with owned and rented land, etc.). From this table, the total number of tenant farms can be obtained as being 20,115 - (Farms with rented land only plus farms with rented land and land in usufruct). The same table reveals also the number of hectares owned, rented or in usufruct in each size group of farms. Exactly the same analysis of the returns for forest enterprises was made.

Since 1888, attempts have been made to obtain information about land tenure by means of the population censuses. The schedule has improved in this respect recently, and in the census of 1920, the farmer was asked whether he was an owner, co-owner, tenant or share tenant. The returns, however, have not been worked up in so much detail, the general classification of owners, tenants and others adopted in 1888 being continued. The tables for all the censuses are therefore comparable. One must remember that they relate only to the agricultural industries of agriculture and cattle breeding and wine culture, omitting the other agricultural industries of poultry farming, gardening and bee keeping. This may be one of the reasons why the number of tenants returned by the population censuses of 1900 and 1910 does not correspond closely with the number of tenant farms as reported in 1905.

Much better information on land tenure and tenancy will be available from the returns of the 1929 farm census. As in the population census, the farmer had to state whether he operated the farm as owner, co-owner, tenant, share tenant, manager, or in usufruct. Another question on the schedule related to the occupation and place of residence of the absentee owners.



Several cantonal and local studies of land tenure could also be mentioned. They were not made, however, on a comparable basis, and are not representative of the whole country.

The United States census has collected data on tenancy since 1830. The later schedules have attempted to obtain more specific information as to types of tenancy. The 1930 census asks for the share received by the landlord under share rental agreements, and whether the rental contract is between members of the same family.

No question is asked in the standard form of the World Census schedule regarding the tenure of farm operators. The following questions, however, are included in the supplementary questions recommended by the International Institute of Agriculture:

1. How many acres in this farm do you own (or are owned by one or more members of your family for the use of which you pay no rent, and for the management of which you receive no salary)?  
.....
2. How many acres in this farm do you rent from others:  
    (a) for cash?..... Acres.....  
    (b) for share of crops? Acres.....
3. How many acres in this farm do you operate for others as a hired manager?..... Acres.....
4. How many acres in this farm do you operate under a different form of tenure from that named in the preceding three questions?  
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Where no country is specified it is understood that the reference is to Switzerland.

The word "yield" used as a sub-head under the various commodities denotes "yield per unit."

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\* In part 2, the Division of Crop and Livestock Estimates of the Bureau of Agricultural Economics has been inadvertently referred to as Bureau of Crop and Livestock Estimates.

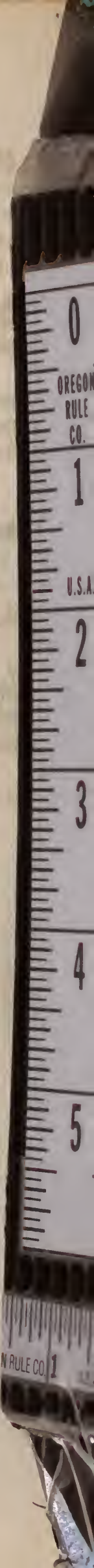


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